

# 247

# motion plastics® news

Spring 2024



# GO ZERO lubrication

**For a lubrication-free world**

Page 6  
A clean AI revolution boosts industry and sustainability

**igus® bicycle components**

Page 106  
After the igus:bike, now structural components from igus® for the bicycle industry



# GO ZERO Lubrication

A clean revolution to boost industry and sustainability:



**Zero lubrication**  
Lubrication-free to protect the environment



**Zero lubrication**  
Save lubrication costs



**Zero lubrication**  
Save lubrication time



**Zero risk**  
Lubrication-free and cost-effective automation



**Zero downtime**  
No unplanned downtime



**Zero waste**  
Sustainable energy supply

# 247 motion plastics® news

Spring 2024

igus



**4**  
YEARS

**Unique:  
4 years guaranteed**

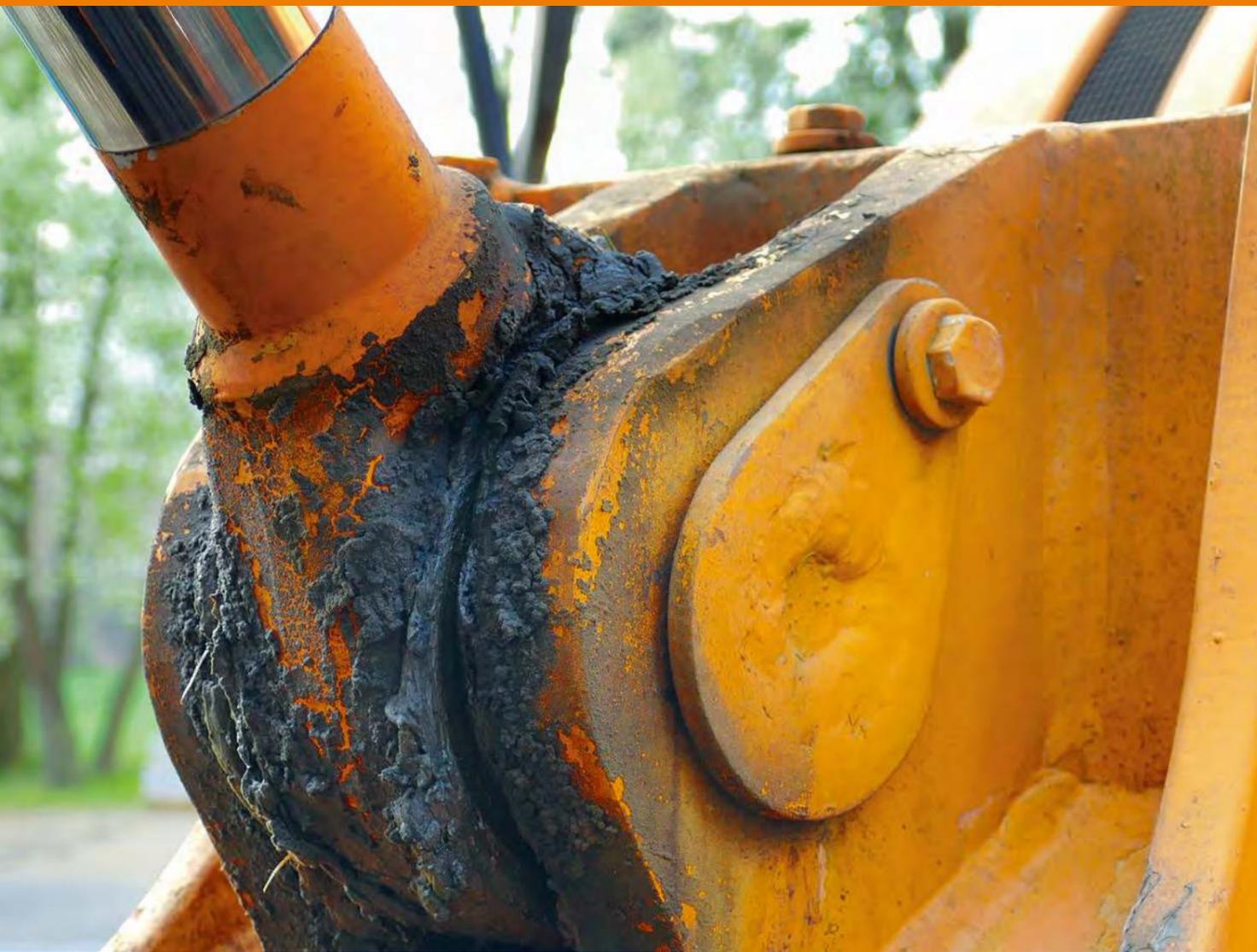
Page 12  
From now on, up to 4-year guarantee on all motion plastics® products with a predictable service life



**igus® bicycle components**

Page 106  
After the igus:bike, now structural components from igus® for the bicycle industry

# #lubrication-free



## Dear customers,

in October 2024, we at igus® will have been producing lubrication-free plastics for industry for 60 years. What began as a passion for the material has developed over the decades with the growth of industrial production into an awareness of the economic and ecological benefits of being able to dispense with lubricants. We love progress and are convinced that the art of engineering, artificial intelligence and digital expansion absolutely belong together in order to create real, sustainable innovations.

You are holding the latest developments for 2024 in your (perhaps digital) hands. We have summarised our innovative

solutions from the product areas by topic and in the focus topics we show you which issues have inspired our product developers this year. You can also find out more about the CO<sub>2</sub> footprint of our products. For more detailed information from the individual product areas, we recommend our new generation of catalogues. We refer to them in the corresponding chapters.

**Have fun browsing and don't hesitate to contact us if you still cannot find your solution.**



Michael Blass,  
CEO e-chain systems®



Tobias Vogel,  
CEO dry-tech®



Dr. Thilo Schultes,  
CEO dry-tech®  
New Businesses



Artur Peplinski,  
CEO igus® International



Frank Blase,  
CEO & entrepreneur

# GO ZERO lubrication

\$240 billion per year is spent on lubrication worldwide. Why? Go zero lubrication! With AI!

[igus.eu/lubrication-free](https://igus.eu/lubrication-free)



igus® factory in Cologne, Germany. The new building from 2023 in the foreground; behind it, the existing factory.

# motion plastics®



e-chains® and  
-systems®

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smart  
plastics

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chainflex®  
cables

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readycable®  
readychain®

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Bicycle  
components

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igidur®  
plain bearings

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igidur®  
rollers

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drygear® gear and  
gearbox technology

Page 136



igidur® slewing  
ring bearings

Page 142



igidur®  
bar stock

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igidur®  
3D printing

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igubal®  
spherical bearings

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xiros®  
ball bearings

Page 174



drylin®  
linear technology

Page 184



dryspin® lead screw  
technology

Page 202



drylin®  
drive technology

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Low Cost  
Automation

Page 238



RBTX®  
marketplace

Page 258

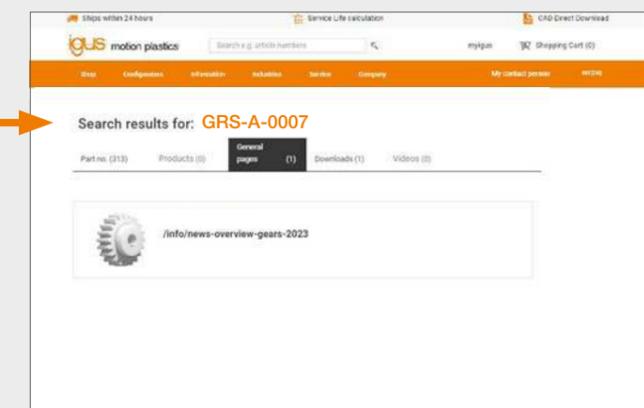


## Print2Digital made easy ...



GRS-A-0007

The QR code will take you directly to the relevant page on the igus® website.  
No mobile device to hand? No problem.  
You can also use the **text code** to go directly to the product page via the search function on our website.



## Our motion plastics® mission

**The world is moving constantly. And when something moves, that's where we come in and offer our customers technical innovations: improve what moves!**

This guiding principle drives us as a manufacturer. We are igus®. We are a manufacturer of high-performance polymers for motion. Since 1964, we have been developing and producing motion plastics®, innovative products made from lubrication-free plastics. Together with you, we improve the technology of your applications or reduce your costs. Ideally, we achieve both: tech up, cost down. By developing products made from low-wear high-performance plastics, we improve motion worldwide, as our products always offer the following advantages:

- Long service life
- No additional lubrication necessary
- Up to 70% lighter than metal products
- Resistant to dirt, chemicals, corrosion, heat, and cold



"By using the igus® e-loop®, Top Drive systems are installed within a few hours instead of the usual days. Moving energy made easy."

**Michael Blass,**  
CEO e-chain systems®

### Improved applications thanks to motion plastics®

Movement is everywhere. We see this every day when we are allowed to accompany our customers in exciting projects. Today we serve 188,000 companies from over 80 countries around the world and from over 50 different industries. In the automotive or packaging industry, railway or agricultural technology, in machine tool construction or in the field of renewable energies, we improve what moves. Together we strive to find the best solution for every application - whether with catalogue or special parts.



"The study at the RWTH Aachen University confirms the enormous savings potential through the use of motion plastics®. Plastic instead of metal saves lubricants, time and money."

**Tobias Vogel,**  
CEO dry-tech®

### How sustainable are motion plastics®?

As a plastics processing company, we see it as our duty to use resources sustainably and to protect the environment. Our motion plastics® can make an important contribution to this - during their production, in use and at the end of their service life. Two topics in particular are very important to us: CO<sub>2</sub> neutrality, i.e. the direct influence on the climate, zero plastic waste in the production and the recyclability of our products through our recycling programmes.



"From now on, a unique 4-year guarantee on all igus® products with a predictable service life. The basis for this is formed by billions of test cycles in our laboratory."

**Dr. Thilo Schultes,**  
CEO dry-tech® New Businesses

### Tested and with a guarantee

Our products made from high-performance plastics offer you one major advantage - a long service life. For you, this means that with our motion plastics® you can utilise your machines and applications for longer and reduce maintenance and costs. To do this, we test our products extensively in our test laboratory and provide you with the data so that you can calculate the service life for your specific product in advance. So you can be sure that our motion plastics® deliver what they promise!



"The new igus® factory with solar panels supports our sustainability activities. Using the change® platform has enabled over 115,000kg of material to be recycled since 2020."

**Artur Peplinski,**  
CEO igus® International

### Recycling plastics and more

Recycling plays an important role in our goal of zero plastic waste, which we pursue with various measures. Technical and industrial plastics can be recycled via our change® recycling platform and recycled plastics can also be bought and sold. We offer bicycles and bicycle components made from recycled plastic on our igus:bike platform. We are promoting the new HydroPRS technology, which enables the chemical recycling of plastic. Our trainee company reguse is dedicated to recycling discarded electrical appliances. And of course we also offer various products made from recycled materials.



"With our online tools, you can configure and calculate igus® products precisely for your application with exact statements on service life, including a one-off 4-year guarantee."

**Frank Blase,**  
CEO & entrepreneur

### Unleash your engineering power with play

Develop and design machines and systems with ease. With joy and fun at work. In a collaborative process that develops and expands creativity and technical know-how. In short: Tech up made easy - that's what enjoyneering® stands for! We presented this concept at the Hannover Messe 2023, which includes real innovations and digital revolutions related to our motion plastics®. The enjoyneering® should enable engineers and technicians to unleash their technical potential with playful ease and to break new ground in problem solving, for example with the iguverse®.

# improve what moves.

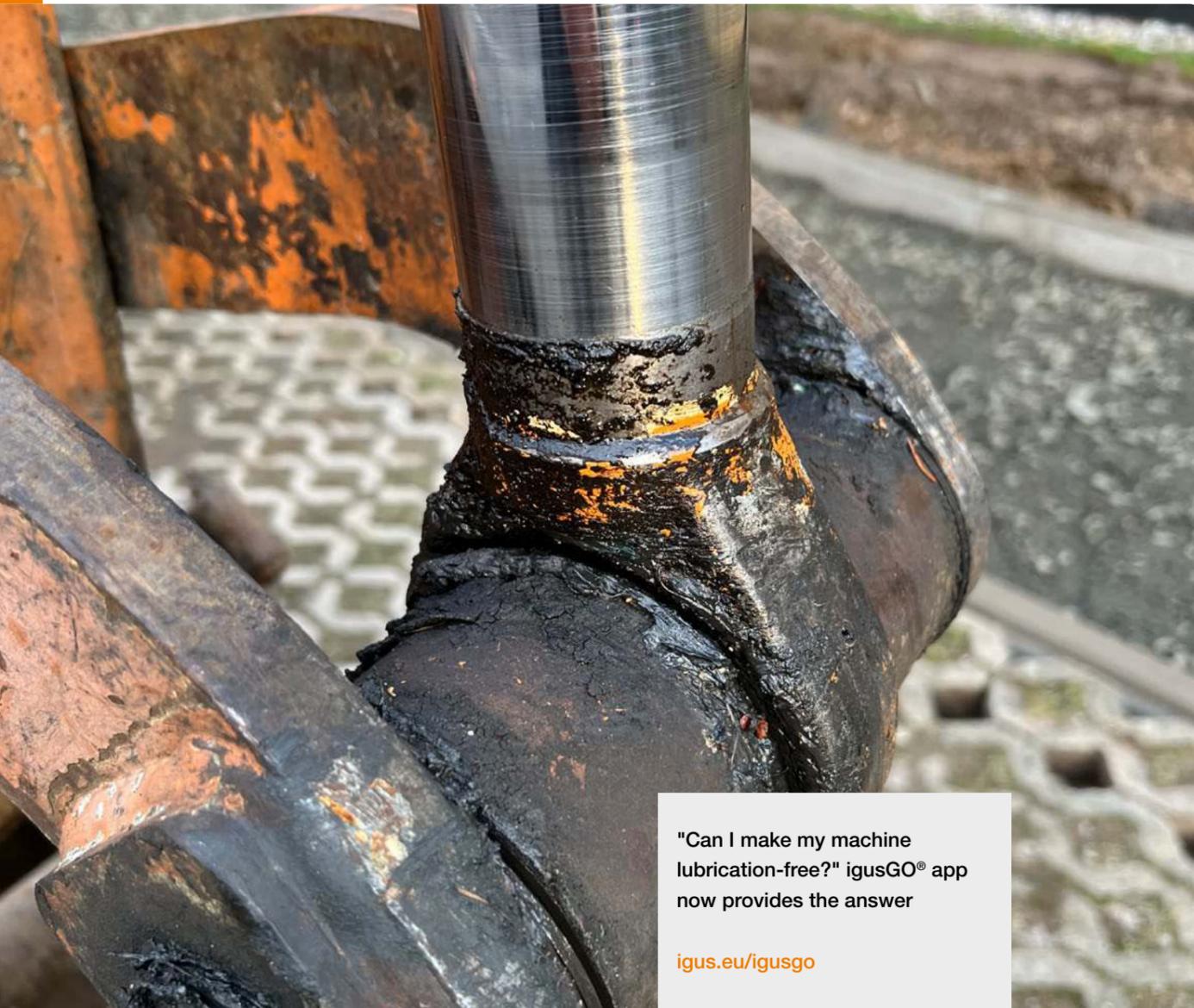
First-time study

#costdown



"The study with RWTH Aachen University confirms the enormous savings potential through the use of motion plastics®. Plastic instead of metal saves lubricants, time and money."

Tobias Vogel,  
CEO dry-tech®



"Can I make my machine lubrication-free?" igusGO® app now provides the answer

[igus.eu/igusgo](https://igus.eu/igusgo)

How a world without lubrication helps industry & the environment

# Clean revolution



RWTH study shows that manufacturers of tractor trailers in Germany alone could immediately save around €60 million

### Why is a lubrication-free world important?

\$750 billion a year is the cost of machine failures due to inadequate lubrication. More than 27 million tons of lubricants seep into water and soil. Despite this, \$240 billion is spent on lubrication every year. A study by RWTH Aachen University quantifies for the first time how lubrication-free igus® plastics are driving the transition to a cleaner world. Manufacturers of tractor trailers in Germany alone could save €14 million in lubrication costs and €45.4 million in labour costs. A world-renowned beer bottler could save a total of €6 million in labour and lubricant costs by using lubrication-free bearings at its 160 sites.

igus® shows how easy it is to achieve the clean revolution - with AI, VR, digital twins and innovative materials: just take a photo of an excavator, crane, bicycle, etc., and the igusGO® app shows where and how lubrication can be dispensed with - including information on service life, cost savings and CO<sub>2</sub> footprint.

**GO ZERO lubrication!**

Read all the study results from RWTH Aachen University here: **"Bearing points without lubrication? Guide, expert tips and practical examples"**

"That works like a well-oiled machine" - Lubrication is so self-evident and important for moving parts that the lubrication condition has even become an established saying. Wherever parts move against each other, lubrication is necessary. It improves the coefficient of friction and protects not only against wear, but also against corrosion and dirt. But it also has its price. [...]

[igus.eu/lubrication-free](https://igus.eu/lubrication-free)



## GO ZERO lubrication!

Save lubrication time and costs

# For the environment



"The new igus® factory with solar panels supports our sustainability activities. Using the change® platform has enabled over 115,000kg of material to be recycled since 2020."

Artur Peplinski,  
CEO igus® International

## 1 Lubrication-free motion plastics®

### High-performance polymers can do a lot

Long service life, no additional lubrication required and up to 70% lighter than metal products, also resistant to dirt, chemicals, corrosion, heat and cold.

### Lubrication-free

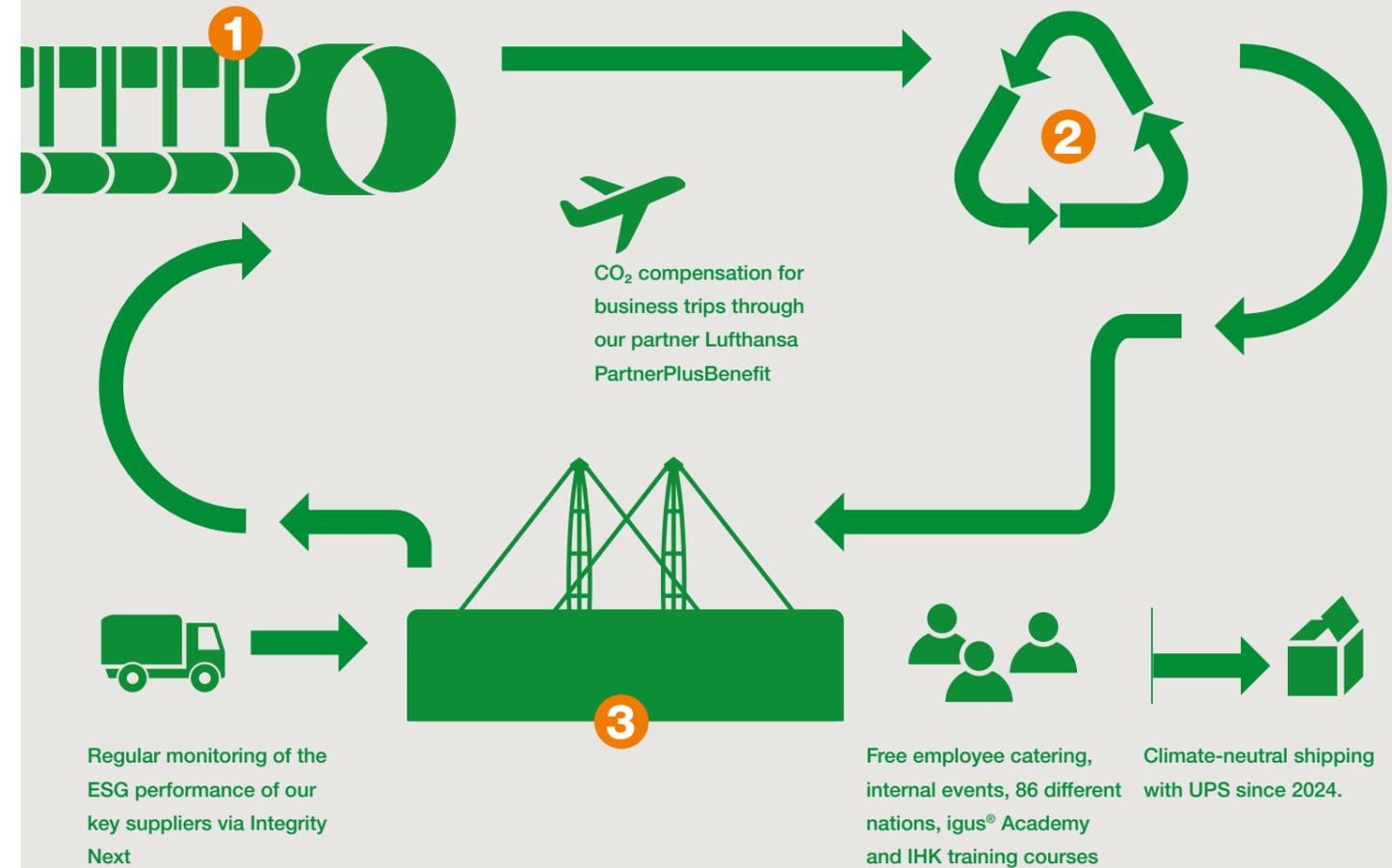
How much motion plastics® can be saved? A joint study by RWTH Aachen University and igus® is the first to investigate how many kilograms of lubricant and the associated costs can be saved in applications if lubrication-free polymer bearings from igus® are used instead of conventional metal bearings.

### Improve what moves

In material and product development, we work on the continuous improvement of friction and wear properties in order to improve the durability of the products and thus conserve resources.

### CO<sub>2</sub> equivalent calculator

Calculation of the CO<sub>2</sub> equivalents for our iglidur® and igumid® G materials in order to incorporate possible CO<sub>2</sub> reductions into the material development. Please do not hesitate to contact us.



### Our current brochure

Find out more about our sustainable business practices, products and partnerships, as well as our measures and progress on the various aspects of sustainability.

[igus.eu/sustainability](https://igus.eu/sustainability)

# #sustainable



## GO ZERO lubrication!

... to protect the environment

\*In order to achieve the quality standards, small quantities of new material may be added during the preparation process

# Sustainability at igus®



## ② change®

### Recycling platform

With change®, we have launched an online platform that accepts recycled material and offers recyclate. Recycling companies, those willing to recycle, regranulate users and suppliers come together here. Become our partner for a successful circular economy:

### Recycling plastics

You can send old energy chains and other industrial plastics (PA, PBT, POM, and many more) to our recycling system in just a few steps. In return, you will receive a voucher from igus®.

### Buy recyclate

Do you want to produce more sustainably and use recycled plastic? On the change® platform, you can find different materials with just a few clicks. Not what you are looking for? Contact us.

### Sell recyclate

Recycling companies, recyclable material suppliers, recyclate dealers, enthusiasts and convinced people: we want you to keep technical plastics in circulation. Become a partner in our network.

[change.igus.eu](http://change.igus.eu)



### Another idea becomes reality

The plastic bicycle RCYL, pronounced [ReCyle]: a solid plastic bike that won't rust. No maintenance, no lubricants. The urban bike of tomorrow is robust, durable and sustainably produced with components made from recycled plastic waste.

[www.igus.bike](http://www.igus.bike)



## ③ Energy supply

### On the road to climate neutrality

In 2023, we achieved 85% less CO<sub>2</sub> emissions than in 2020. The switch to green electricity in mid-2021 and to green gas in October 2021 played a key role here.

### Solar energy

igus® currently generates 500,000kWh per year through photovoltaic systems, with more in the pipeline. In total, more than 2,000,000kWh is feasible per year anything.

### Would you have known?

igubal® pillow block bearings are often used in the bearings of large solar panels.

### Application example

#### 3,000 shore power connections per year

The Mongstad offshore base is one of the most frequently used bases in Norway. The shore power e-spool® makes sure that the vessels that change twice a day are reliably supplied with shore power. Integrated in a 10-foot container, it can be positioned as desired.

[igus.eu/shore-power](http://igus.eu/shore-power)



igus® guarantee



"From now on, a unique 4-year guarantee on all igus® products with a predictable service life. The basis for this is formed by billions of test cycles in our laboratory."

Dr. Thilo Schultes,  
CEO dry-tech® New Businesses

**Guarantee  
igus Products**

**4  
YEARS**

**up to 4 years guarantee**

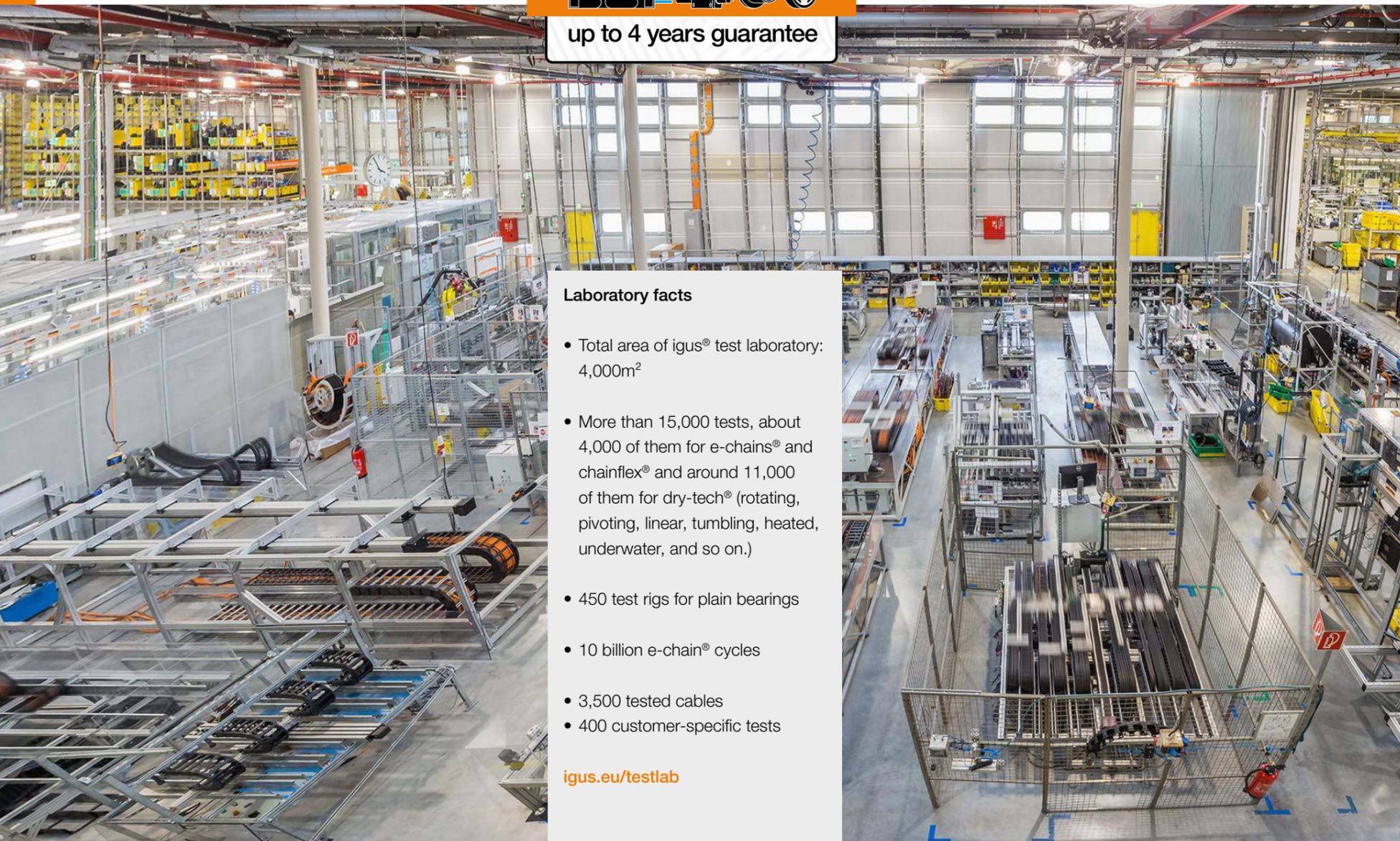
Unique: guarantee for all predictable igus® products

# 4 years. Reliable.

We offer a manufacturer's guarantee of up to four years on all products with a predictable service life. The guarantee service gives the buyer the security of knowing that their individual application has been designed exactly right and that they are always choosing the most favourable product that is sure to work.

[igus.eu/guarantee](https://igus.eu/guarantee)

## #guarantee



### Laboratory facts

- Total area of igus® test laboratory: 4,000m<sup>2</sup>
- More than 15,000 tests, about 4,000 of them for e-chains® and chainflex® and around 11,000 of them for dry-tech® (rotating, pivoting, linear, tumbling, heated, underwater, and so on.)
- 450 test rigs for plain bearings
- 10 billion e-chain® cycles
- 3,500 tested cables
- 400 customer-specific tests

[igus.eu/testlab](https://igus.eu/testlab)

	iglidur® plain bearings		xiros® ball bearings
	iglidur® other products		drylin® linear technology
	iglidur® slewing ring bearings		dryspin® lead screw technology
	iglidur® bar stock		drylin® drive technology
	iglidur® gears		e-chains® and e-chain systems®
	iglidur® 3D printing		chainflex® cables
	igubal® spherical bearings	Up to 4-year guarantee on motion plastics® of these product ranges	

## GO ZERO lubrication!

... for planning security

Energy supply of the future

# Permanent innovations



"By using the igus® e-loop®, Top Drive systems are installed within a few hours instead of the usual days. Moving energy made easy."

Michael Blass,  
CEO e-chain systems®



## igus® as an innovative development partner for the energy supply systems of the future

We at igus® specialise in wear-resistant, lubrication-free and low-maintenance components made of high-performance plastics for moving applications of all kinds. Every year, we introduce a large number of new innovations that ensure the considerable, steady growth and sustainable corporate success of igus® GmbH. The focus of these many new products and product range additions is particularly on specific applications that we can improve technically and/or solve more cost-effectively, true to our slogan "Tech up, cost down". In addition to concrete, tested new products, we also regularly present design studies, i.e. ideas that have been developed into initial drafts in order to sound out market potential. Here, too, there is usually already a specific challenge/application in the background.



# #enjoyneering

## enjoyneering® at the trade show stand

We will be showcasing these inspirations in physical models in a dedicated area at our trade show stand at Hannover Messe 2024. Our internal working title for this area is "Developer's Playground" - and that's exactly what it should be. What we expect from it is expressed very appropriately in our neologism enjoyneering®. Technicians and engineers are often curious by nature and have a strong urge to explore. Playing and experimenting with new technologies and ideas results in innovative solutions and products. This creative process helps to push the boundaries of what is possible and opens up new perspectives in technology and production. It is precisely this urge to play and experiment that we are promoting again this year at the Hannover Messe to enable outstanding achievements in industry - with igus® enjoyneering® unleash your engineering power with play!

[igus.eu/info/e-chain-innovation](https://igus.eu/info/e-chain-innovation)

In addition to these, we have many more ideas in the pipeline and in the minds of our product developers. This year, we would like to share what we consider to be the most exciting ideas with a wide audience and inspire machine and system designers in particular with these functional samples. We are represented by our products in almost all industries and sectors and therefore have a good insight into the general developments there - but of course the design engineers of the machine manufacturers are always at least one step ahead of us. The machine concepts of the future pose new challenges in terms of moving machine components. And as an innovative development partner with decades of experience, we are more than happy to help!



## GO ZERO waste!

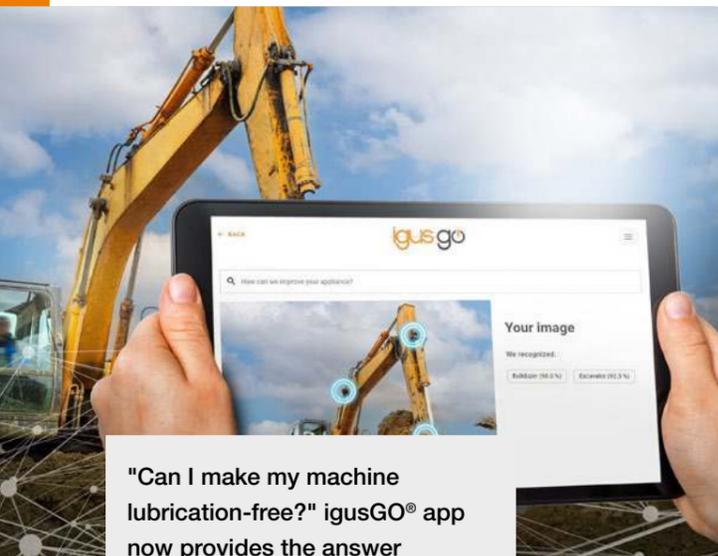
### Sustainable energy supply

# #digital



"With our online tools, you can configure and calculate igus® products precisely for your application with exact statements on service life, including a one-off 4-year guarantee."

Frank Blase,  
CEO & entrepreneur



"Can I make my machine lubrication-free?" igusGO® app now provides the answer

How can I easily improve my machine? The answer is: with the new igusGO® app. igus® has used AI to develop a unique app for product searches. Simply take a photo of the application and its surroundings and the igusGO® intelligence shows the user which products can help, for example, to achieve a lubrication-free design. The app also shows where there is even more potential to improve the technology of machines and even save costs in the process.

[igus.eu/igusgo](https://igus.eu/igusgo)



Our digital services and solutions as brochure PDF for download.

[igus.eu/enjoyneering](https://igus.eu/enjoyneering)



**smart IIOT**  
Factory monitoring



**Next Best Standard**  
Service for engineers

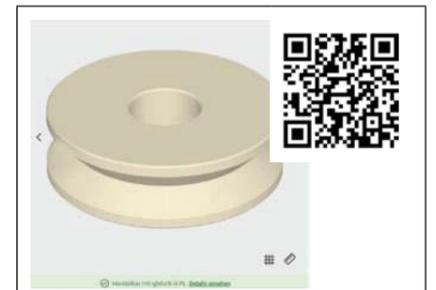
# igus® online tools



**iguverse®**  
Virtual engineering



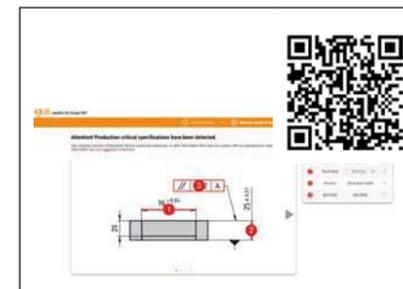
**kopla®**  
Software platform



**speediPrint**  
3D printing service



**speediCut**  
CNC service



Tolerance check



Online configurators



**iIdentify**  
AI spare parts service



Augmented Reality



**RBTX®**  
Marketplace for Low Cost Robotix

## GO ZERO Lubrication!

... with AI and digital tools

motion plastics® for heavy-duty applications

# Heavy plastics

#heavyduty



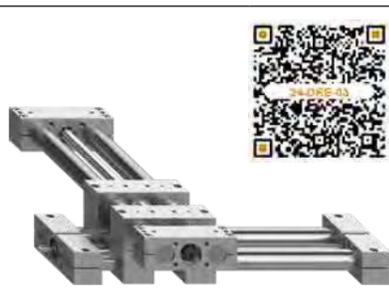
**igutex® TXH**  
Homogeneous design and resilient



**TRM triflex® rotation module**  
For large rotation angles and high fill weights



**igidur® Q3E**  
For extreme loads



**drylin® SLR linear systems**  
More loads, more dynamics



**igidur® Q2LW**  
Cost-effective heavy-duty plain bearings



**drylin® ZLX toothed belt axis**  
Variable mounting options, robust design

motion plastics® made of high-performance plastic are robust, dirt-resistant and maintenance-free. Ideal for heavy-duty applications in agricultural machinery, excavators and industrial cranes.

It is worth replacing metallic bearings in agricultural machinery, excavators and industrial cranes with heavy-duty motion plastics®.

These are not only robust but also durable and fail-safe because their flexibility means they absorb shocks and bumps better than many metal alternatives. Furthermore, bearings made of high-performance plastic are lubrication-free, which saves time and money. And polymer bearings are many times lighter. An effective contribution to more energy efficiency.

[igus.eu/heavyduty](http://igus.eu/heavyduty)

motion plastics® for cleanrooms and laboratories

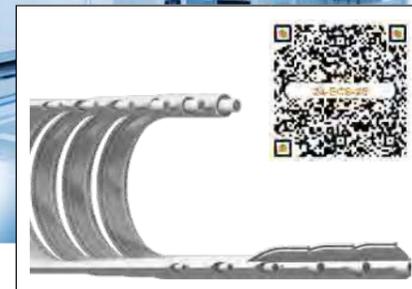
# Clean plastics

#cleanroom

#lab



**C6.38 e-chain®**  
Cleanroom all-rounder



**e-skin® flat single pods**  
Maximum modularity for the smallest installation spaces



**e-skin® soft ESD**  
For cleanroom and ESD

Medical and laboratories require components that fulfil the highest hygiene standards. Similar requirements apply to cleanrooms, as the smallest impurities jeopardise the production of high-tech components in the field of microelectronics, etc.

motion plastics® are clean and quiet, corrosion-resistant and completely maintenance-free. Ideal for medical and laboratory equipment, especially with small dimensions for small installation spaces. We develop and test our products for the cleanroom in our own cleanroom laboratory. Moreover, in order to provide solid proof for cleanrooms, the Fraunhofer Institute subjects them to further tests. This enables a broad product portfolio with cleanroom classification (up to ISO Class 1).

[igus.eu/cleanroom](http://igus.eu/cleanroom)



**ReBeL® tested for laboratories**  
Cleanroom Class 4



**Lead screw motors NEMA 8**  
Drive solution for confined spaces



**Clean SCARA Cable Solution**  
For high-speed SCARA applications



**CFCLEAN cable elements**  
40 million double strokes in cleanrooms guaranteed

motion plastics® for hygiene-sensitive areas

# FDA-compliant ... ... food-safe

Packaging is often required for sensitive goods such as food and beverages. In these complex production lines, speed, precision and purity are of the essence. Adapted to the requirements of the packaging industry, we offer a wide range motion plastics® that conform to FDA and EU10/2011 stipulations, run without lubrication and maintenance breaks and make their contribution to economical production.

Our high-performance polymers for the food sector can be sterilised with hot steam and cleaned with chemical substances without any problems. They fulfil essential requirements for use in food processing machines and production processes (food safety). The blue colouring also makes them easy to detect.

[igus.eu/packaging](http://igus.eu/packaging)  
[igus.eu/food](http://igus.eu/food)



**Ball bearing roller adapters**  
made of iglidur® A500  
The high performer



**igidur® AX500 plain bearings**  
Wear-resistant, electrically conductive  
high-temperature material

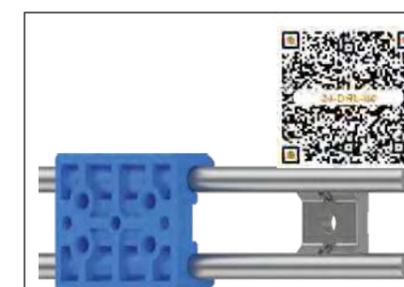
## #packaging



**xiros® PVC conveyor roller with**  
**C160 flanged ball bearings**  
The all-rounder for material handling



**Miniature linear carriage made**  
**of stainless steel**  
Easy to assemble, easy to clean



**Miniature carriage made of**  
**igidur® A230**  
Small and lightweight



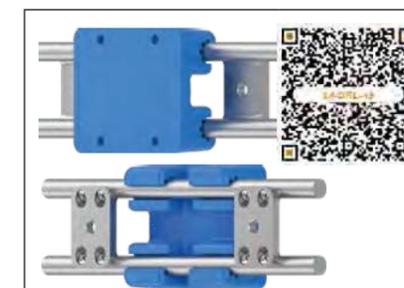
**igidur® IC-05PF coating powder**  
The all-rounder with FDA



**xiros® paper guide rings**  
Label and film guidance  
made easy



**Narrow linear housing**  
**WE7UMS-01-Ø**  
Save 20% installation space



**drylin® Hygienic design modular**  
**system** Corrosion-resistant,  
hygienic, germ-free



**igidur® AD210 gears**  
FDA-compliant and magnetic

motion plastics® for PTFE and PFAS-free applications

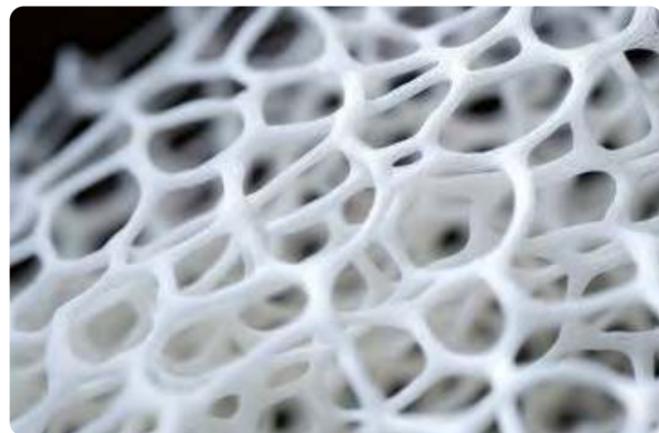
# igus® products and PTFE/PFAS



#PTFE  
#PFAS

Like the chemicals of the PFAS family, certain polytetrafluoroethylene compounds - PTFE for short - are considered "forever chemicals" and therefore potentially harmful to the environment, people and animals. The European Union is therefore working on a ban on the substances. Many igus® materials do not contain PTFE and are therefore not affected by a ban, also the majority of chainflex® cables are already PFAS-free.

[igus.eu/ptfe](https://igus.eu/ptfe)



**chainflex® cables**  
No PFAS in 95% of igus® chainflex® cables today



**igidur® JPF round bars**  
High wear resistance, without PTFE



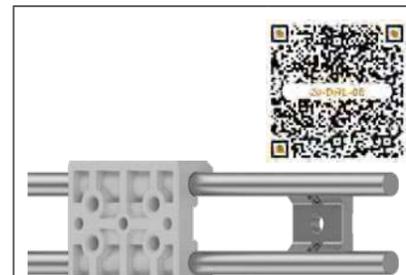
**igidur® JPF plain bearings**  
Wear-resistant and versatile without PTFE



**igidur® FPF plain bearings**  
Conductive and PTFE-free



**igidur® i230 powder for SLS printing**  
PFAS-free all-rounder for higher application temperatures



**Solid plastic carriages made from iglidur® RN403** fast assembly, easy storage, PTFE-free



**NWV prism carriages** PTFE-free, for controlled adjustment



**High performance carriages** PTFE-free switch from rolling to sliding



**Telescopic rails, NT-35 series** with PTFE-free centre rail



**Three-part polymer extension** Metal and PTFE-free



**igidur® R lead screw nuts** No vibration, PTFE-free

motion plastics® for easy installation

# Tech up made easy



#assembly

As "easiest to deal with company", we want to make it easy for our customers. What starts with the selection and configuration on the web also applies to the installation of our motion plastics®.

Simple, fast and therefore cost-effective, as there is little downtime for the application. Either through pre-assembled systems or clever design that simplifies replacement in your existing application. And even with more complex systems such as the e-loop® for top drives, the basic principle of "hours instead of days" applies. Tech up made easy.

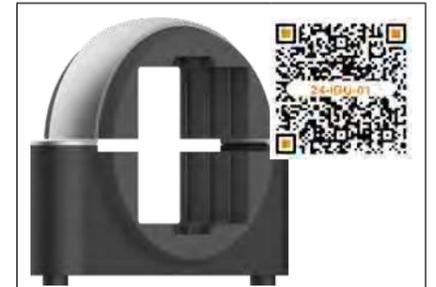
[igus.eu/assembly](https://igus.eu/assembly)



**igubal® split flange mounted bearings** Easy to retrofit in existing applications



**igubal® fixing collars made from plastic** Ideal for confined installation spaces



**igubal® ESQM-2.0 pillow block bearings** Absorption of high stationary loads



**e-loop® retrofit mounting consoles** Service loop retrofits in the shortest possible time



**triflex® R TRE.85.135.0.C** Stronger connection with simplified assembly



**Office Chain Oval OCO.32.37.0** Energy supply for moving desks



**guidelok swing - self-adhesive version** Compact solution, super-fast installation, without drilling



**Miniature XY table in two versions** Two adjustment directions in the smallest installation space



**drylin® SLR linear systems** More loads, more dynamics



**drylin® ZLX toothed belt axis** Variable mounting options, robust design



**ReBeL® gripper bundles** Flexible and easy to replace



**chainflex® CASE Refill** Easy cable replacement

GO ZERO waste ... sustainable energy supply

# e-chain systems<sup>®</sup> and accessories



Tech up



Cost down



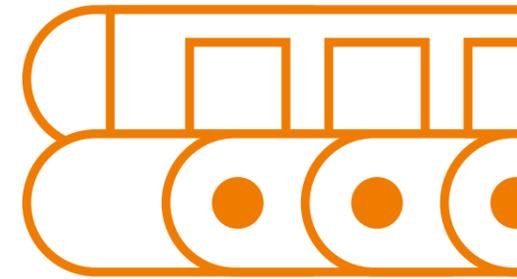
Proof



Sustainability



Digital



## 28

**12 more months that are guaranteed to pay off**

4-year e-chain<sup>®</sup> guarantee

## 30

**Beautifully functional**

Office Chain Oval OCO.32.37.0

## 32

**Strong and cost-effective**

E2C.38 one-piece e-chain<sup>®</sup>

## 36

**Strong, light and cost-effective**

E4Q.58L e-chain system<sup>®</sup>

## 46

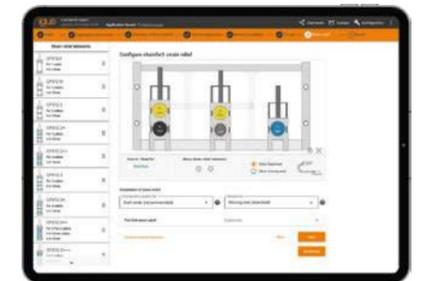
**Optimum protection for charging cables**

e-tract DC

## Blog topics

**#assembly, page 24**

motion plastics<sup>®</sup> for  
easy assembly



## Online tool

**Configurator for  
CFX strain relief clamps**  
[igus.eu/irm-configurator](https://igus.eu/irm-configurator)



## Rotary stacking crane

Lifting 3,500 tons into the air: e-chains<sup>®</sup> of the E4.56 series from igus<sup>®</sup> with chainflex<sup>®</sup> cables are installed in the world's largest rotary stacking crane from Shanghai Zhenhua Heavy Industry.



## Catalogue

Available soon: All information on energy chains and energy chain systems. Tested and with up to 4-year guarantee. MAT0075662.20

# [igus.eu/news-ecs](https://igus.eu/news-ecs)

New e-chain® guarantee

# Unique: 4 years guaranteed!



New

## 12 more months that are guaranteed to pay off

### 4-year e-chain® guarantee

The unique e-chain® guarantee is now extended to four years. With the clear statements on the guaranteed service life, you as a customer gain additional planning security for your complete energy supply solution from igus®.

- ▲ Planning reliability for the entire energy supply solution (e-chain® and chainflex® cables, cf. p. 84) with a guarantee that is up to four times longer than the statutory guarantee
- ▼ Always find the most cost-effective e-chain® for the required service life using the service life calculator
- Calculated service life on the basis of approx. 4,000 e-chains® tests in the igus® laboratory (with approx. 10 billion e-chains® cycles), almost 10,000 e-chain systems® already installed on crane systems worldwide
- Sustainability thanks to a longer service life is practical resource protection, enhancing economic efficiency and protecting the environment

Online service life calculator for calculations in seconds: [igus.eu/ESL](https://igus.eu/ESL)



Optimised online tool for application-specific service life calculation

## Predictable safety for over 19,500 chain types

Since 2020, igus® has provided up to 36-month guarantee on the service life of its own energy chains. The basis for this unique guarantee promise is the e-chain® service life calculator. The online tool calculates an individual service life for each application based on the entered application-specific parameters. The result is the number of double strokes that will be achieved if these application parameters are adhered to. Optimisation of the online tool last year has made operation even more intuitive. In addition, the results are even closer to reality. "The countless test results from the igus® laboratory as well as our decades of experience in the field in tens of thousands of applications have been incorporated into the optimisation, so that the algorithm could be further sharpened. In many cases, the service life promise has been increased as a result," says Andreas Hermey, Head of Development for e-chain

systems®. By evaluating the guarantee certificates previously created using the service life calculator, standard use cases could be analysed. In addition, our own calculations and customer interviews were carried out. This resulted in a reliable picture of standard applications for the igus® energy chains, which was compared with the calculation results of the service life calculator.

### Christian Ziegler, Head of Product Management e-chains®:

"The result of our analysis was that in many cases, the calculated number of double strokes was not achieved in practice within the 36 months. As we continue to fully support the calculated number of cycles, we are increasing our guarantee period to four years."

### Continuous further development

The online service life calculator for e-chains® has been further improved: this year, two additional installation positions were added in the area of unsupported energy chains. In addition to the standard with continuous support of the lower run, the service life can now also be calculated for partially unsupported lower runs and for inclined energy chains, and the 4-year guarantee certificate can be created in just a few steps.



**Christian Ziegler**  
Head of Product Management e-chains®



**Andreas Hermey**  
Head of Research and Development e-chains®

### The optimised service life calculator

### Calculation example:

- 1 Energy chain E4Q.58.150.200.0 with an unsupported travel of 7m and 8kg/m fill weight. Calculated service life: 20.7 million double strokes.
- 2 At a speed of 2m/s, this application would have to run continuously for four and a half years to complete the calculated number of double strokes.
- 3 The new 4-year guarantee therefore covers even more standard applications while maintaining the realistic, reliable promise of maximum double strokes for more critical applications.

# Beautifully functional



New

## Energy supply for moving desks

Office Chain Oval OCO.32.37.0

Organised cable guidance is mandatory for moving desks. With the new OCO.32.37.0, it's a piece of cake. It also has a simple design that blends unobtrusively into any office. When straight, it is closed on one side, which makes for a visually simpler design. The one-piece construction with concealed pin/bore connection also ensures a harmonious appearance.

- ▲ Semi-enclosed design for a harmonious appearance
- ▼ Quick filling and easy assembly thanks to igus® easy design
- Tested in the igus® laboratory
- Have your energy chain recycled at the end of its service life with the igus® change® recycling program, regardless of manufacturer: [igus.eu/change](https://igus.eu/change)



### igus® Office Chain

## Developed with world-renowned office furniture manufacturer

In 2019, talks began between the igus® subsidiary in the USA (igus® inc) and a global player for office furniture also based there about a new concept for a furniture energy chain. They currently use a self-designed, relatively lightweight cable tray. So they were looking for something stronger and more visually appealing to modernise their desks. igus® provided some initial samples of these custom design concepts and made good progress in defining a solution. However, in 2020/2021, business slowed down due to the uncertainty caused by COVID and the future of general office space, so the global player cancelled the development process on their side.

igus®, however, continued to pursue the project, and was able to present an updated concept with a refined design towards the end of 2022. This impressed the office furniture manufacturer and they took up the project again. Over the past 2.5 years, they have gone through several design iterations, optimising the size, strength and aesthetics of the chain, as well as testing its function with the customer's cables inside. The current design uses a bracket at both ends that can either be screwed or attached with a special rubber-coated magnet to provide additional support on the

work surface. Due to the high order volumes placed by this global office furniture manufacturer, the oval office chain (OCO for "Office Chain Oval") was produced in two of its own colours. With the knowledge of the igus® material experts, these special colours could be implemented. This project is a great example of international teamwork and perseverance.



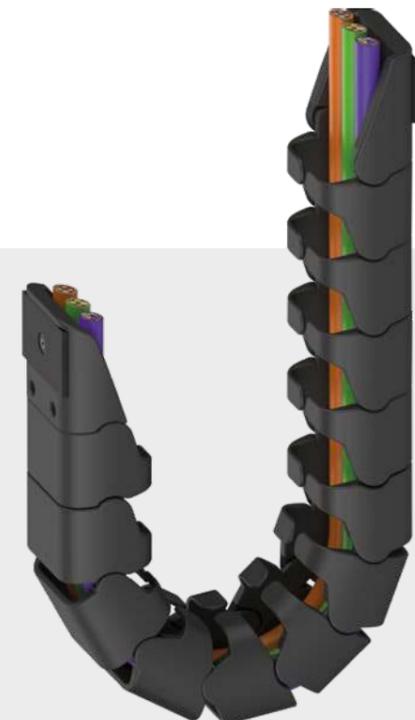
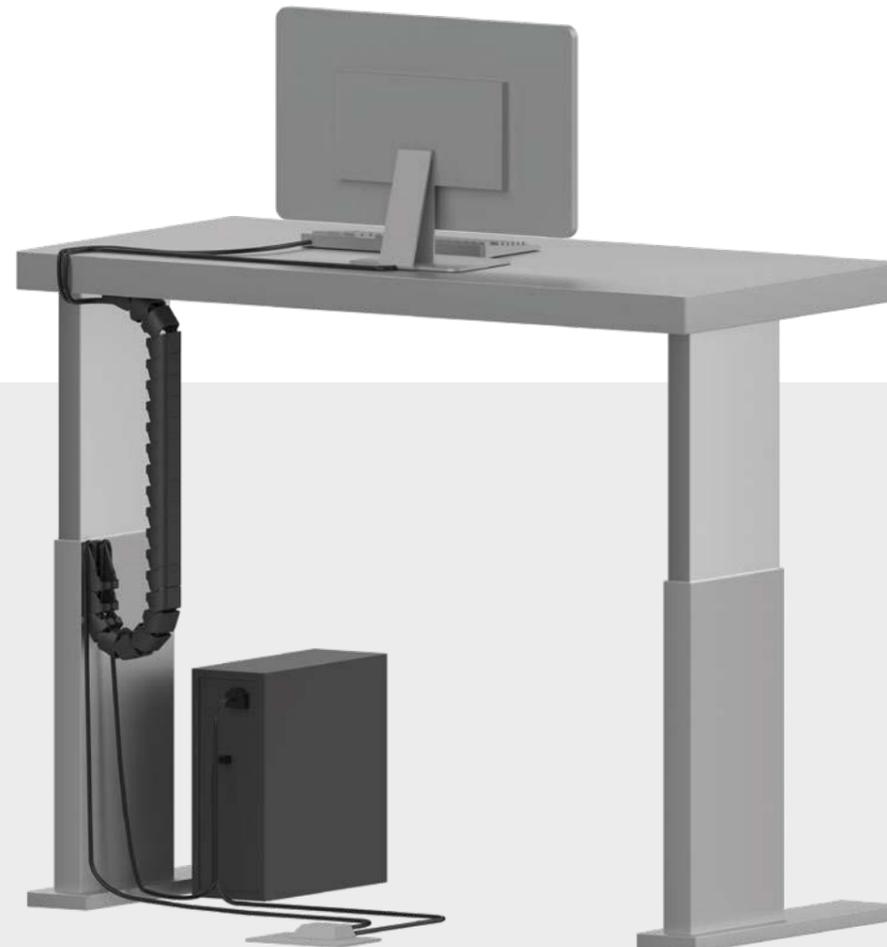
**Dan Thompson**  
Product Manager  
e-chains® igus®  
Inc.



**Patrik Theisen**  
Head of International Sales  
e-chain®



**Thilo Jaeker**  
Deputy Head of Research and Development



E2C.38 one-piece e-chain® for construction machinery

# More space for hydraulics



New

## Strong and cost-effective

E2C.38 one-piece e-chain® for construction machinery

Addition to the successful E2.1 product range. Closed (non-openable) versions now also with an inner height of 38mm. Cost-effective with increased additional load, making it ideal for guiding hydraulics. Available in four widths: 50, 75, 90 and 100mm.

- ▲ One-piece, non-openable, integrated brake
- ▼ More cost-effective than the E2.1 series (up to 33%)
- 20% more additional load and 25% more unsupported length than the E2/000 series
- Have your energy or drag chain recycled at the end of its life cycle in the igus® chainge® recycling program. No matter which manufacturer: [igus.eu/chainge](https://igus.eu/chainge)
- 🔗 Online tools for digital configuration and individual service life calculation



New #assembly

## Modular and flexible

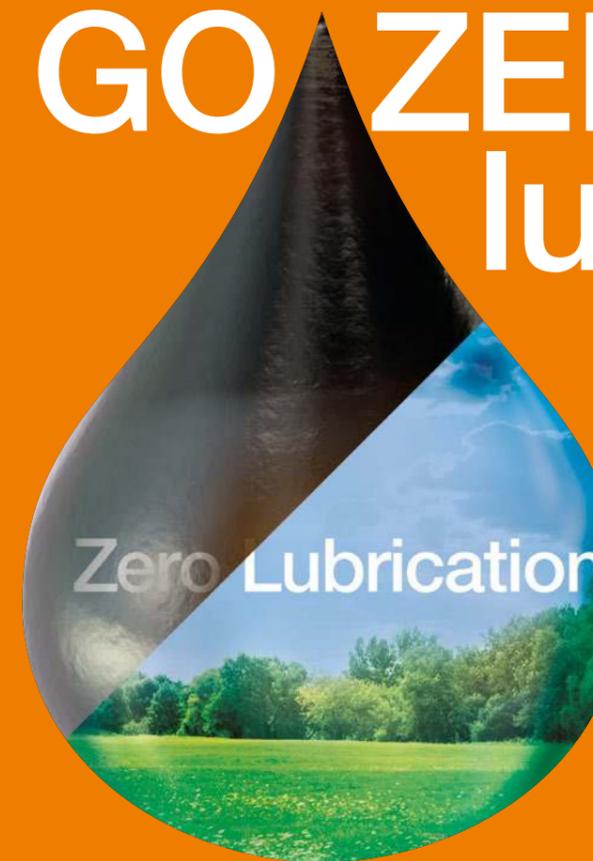
Mounting brackets for the E2.26 and E2.38

New modular mounting bracket concept with a three-part structure in which two outer links are stabilised by a tie-wrap plate.

- ▲ Flexibility through additional installation options
- ▼ Backwards compatible: existing systems/configurations can be retrofitted
- 50% faster assembly of the mounting brackets thanks to separate assembly of the individual parts (compared to one-piece mounting brackets)
- Have your energy chain recycled at the end of its service life with the igus® chainge® recycling program, regardless of manufacturer: [igus.eu/chainge](https://igus.eu/chainge)



# GO ZERO lubrication



27 million tons lubrication go into water and earth every year. Why? Go zero lubrication! With AI!

igus®





New #assembly

## Simple and cost-effective quiet operation

### Damper clip for series E2i.48

For sound reduction in unsupported applications. The damper clip can also be retrofitted to existing applications.

- ▲ Easy to retrofit - no rework of the chain links necessary
- ▼ 70% more cost-effective (compared to the predecessor series S3400)
- Up to 5dB(A) noise optimisation compared to the E2i.48 series
- Have your energy chain recycled at the end of its service life with the igus® change® recycling program, regardless of manufacturer: [igus.eu/change](https://igus.eu/change)



New #assembly

## Holding force doubled

### New crossbars E2.26F and E2.38F

New crossbar with significantly increased holding force for the E2.26 and E2.38 series. Easy insertion of cables and hoses. Particularly suitable for guiding hydraulic hoses.

- ▲ Significantly increased holding force, especially for hydraulics and heavy cables
- ▼ Faster filling compared to the E2C.26
- 80% faster assembly thanks to simple insertion of the filling
- Have your energy chain recycled at the end of its service life with the igus® change® recycling program, regardless of manufacturer: [igus.eu/change](https://igus.eu/change)



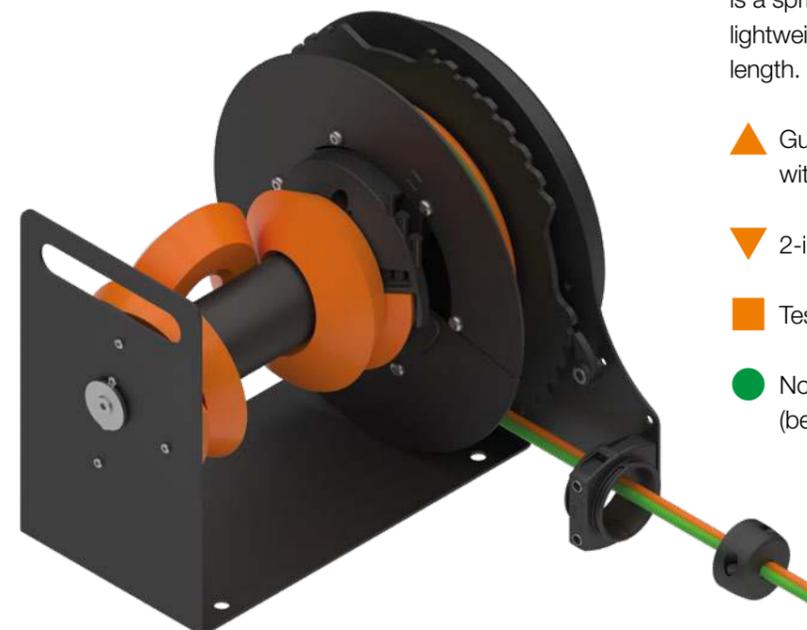
New #assembly

## Space-saving guiding without trough

### Magsnap for E2i.15

For vertical hanging applications where guide troughs cannot be used for space reasons. Magnets hold the e-chain® in the specified direction and "fix" it to the metal wall.

- ▲ Safe guidance in smaller installation spaces
- ▼ Upgrade existing systems cost-effectively
- Reduction of metal by approx. 90% due to elimination of guide plates
- Have your energy chain recycled at the end of its service life with the igus® change® recycling program, regardless of manufacturer: [igus.eu/change](https://igus.eu/change)



Study

## Two cables, no slip ring

### Multicable e-spool® / SPMC e-spool®

With the new multicable e-spool®, up to two cables can be unwound seven metres without a slip ring. The SPMC1.\* is a spring-driven cable drum. Compact, space-saving, lightweight. Available in two sizes: for 2m and 7m extension length.

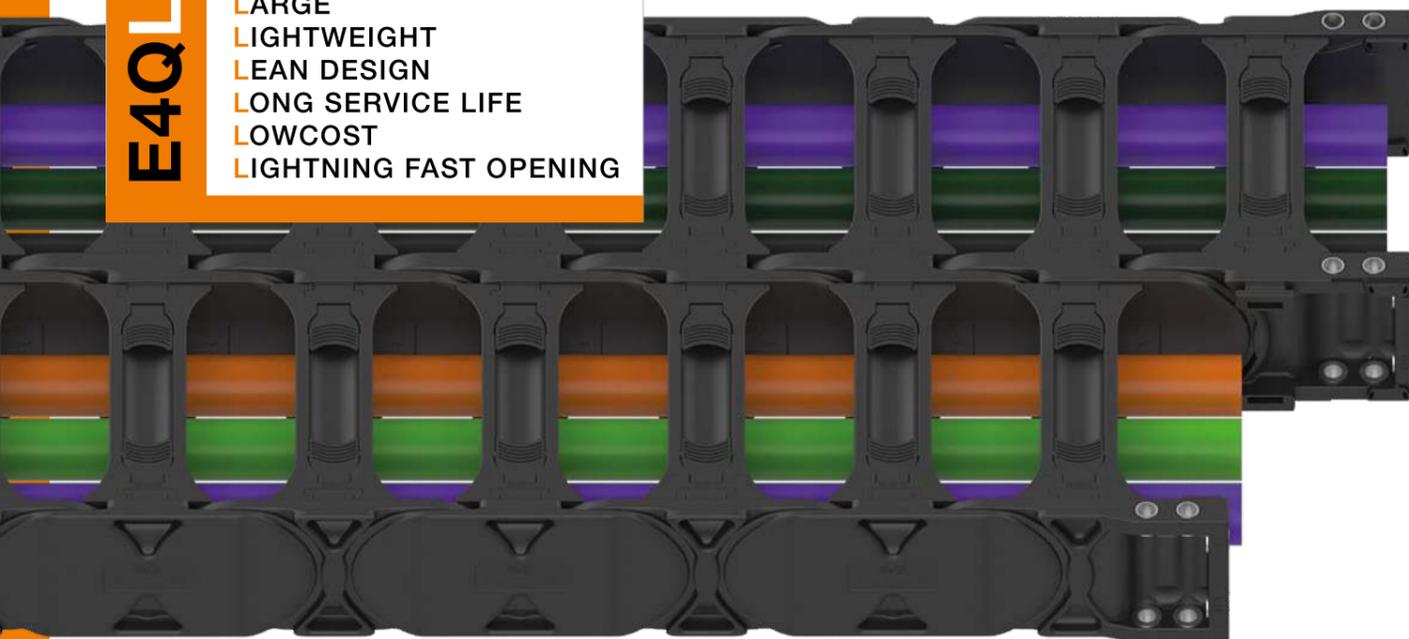
- ▲ Guide different media and diameters in one system without interruption
- ▼ 2-in-1 concept saves money and space
- Tested in the igus® laboratory
- No additional copper components in the system (besides copper in the cables)



# Strong, light, flat

**E4QL**

- LARGE
- LIGHTWEIGHT
- LEAN DESIGN
- LONG SERVICE LIFE
- LOWCOST
- LIGHTNING FAST OPENING



**New**

## Strength and light weight for small installation spaces

E4Q.58L e-chain system®

Based on the successful E4Q, there is now the second size of an L variant with an inner height of 58mm. The E4Q.58's proven quick-opening crossbar allows intuitive, tool-free opening and closing. The complete range of widths, from an inner width of 100mm to 500mm, is available directly from stock.

- ▲ Proven E4Q design that is 10% stronger than the previous 14040 series
- ▼ Depending on the width, around 10-15% less cost than the E4Q.58 thanks to slimmer side links
- Breaking torque E4Q.58L approx. 10% higher than series 14040
- Reduced use of materials thanks to L design (about 15% lighter than E4Q.58 with the same width)
- 🔗 Online tools for digital configuration and individual service life calculation



## L variant with proven benefits as standard The special design of the E4Q.L

**Why is the E4Q.L series being extended to an inner height of 58mm?**

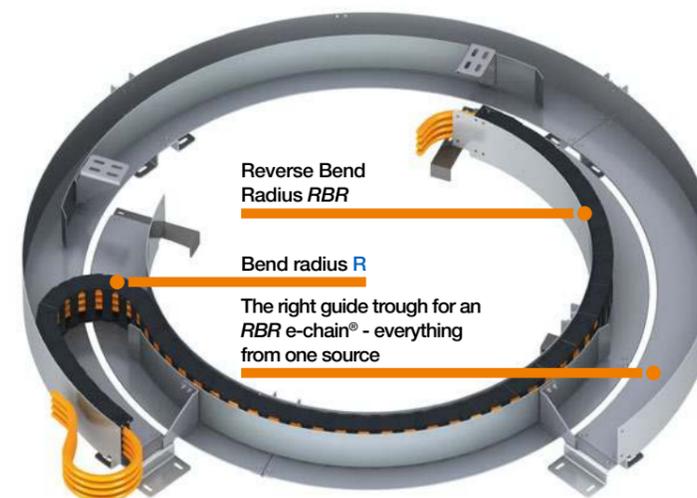
The development of the E4Q.64L has shown that the demand for so-called "light" chains remains high. These series are often used in unsupported applications where maximum stability is not required. For applications with the highest demands on strength, we recommend the standard E4Q series. In applications with lower dynamics, however, our standard E4Q series is quickly oversized. In order to save costs for our customers, we have further developed the "light" and have now added the E4Q.58L to our product range in addition to the E4Q.64L. It will replace the previous version 14040.

**What characterises the L version of the E4Q?**

The innovative design of the E4Q series has been adapted to the L version. The L version weighs approx. 15% less than an E4Q.58 and can therefore be offered up to 15% cheaper than an E4Q.58. The E4Q.58L also offers approx. 10% more stability than its predecessor, the 14040 series. This means that the E4Q.58L can be used in unsupported applications with low or medium loads, e.g. machine tools, woodworking or even car washes, and can save costs.

**What other highlights does the E4Q.58L offer?**

As the stop-dog system of the E4Q.L series has been completely rethought, the E4Q.58L can now be ordered with a 100mm radius as standard. In addition, the new stop-dog system enables a reverse bend radius of 100mm and can now also implement demanding rotary movements. In addition, the E4Q.58L with its three stop-dogs offers more stability and service life compared to its predecessor series 14040.



**Phillip Hagedorn**  
Product Manager  
e-chains®

**Stefan Strack**  
Development  
Engineer  
e-chains®

**New #assembly**

## Easy e-chain® extension

Extension link for the E4Q.58L

The extension link can be used to easily extend an existing e-chain® configuration in order to guide a large number of cables or especially heavy cables in one chain.

- ▲ Guide additional cables and/or implement a higher fill weight
- ▼ The extension link makes an additional e-chain® unnecessary
- Further optimisation based on the tried-and-tested E4 extension links, which are already used in numerous applications





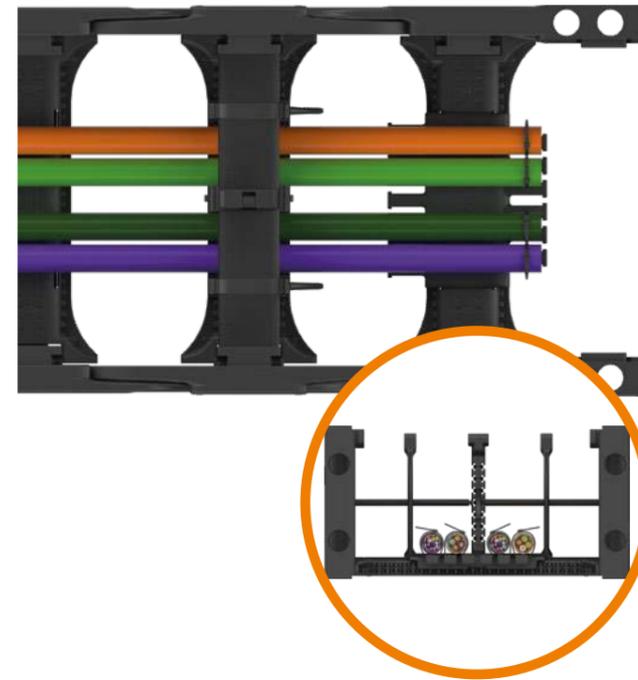
**New**

## With increased holding force

### Locking separator 82.8 for the E4Q.82

Locking separators for higher holding/opening forces in high humidity and/or large hydraulic hoses. Soon also available for the E4Q.58.

- ▲ More interior separation options for more flexibility
- ▼ Guide hydraulic hoses safely
- Well-known and proven from the E4.1 modular system
- Have your energy chain recycled at the end of its service life with the igus® chainge® recycling program, regardless of manufacturer: [igus.eu/chainge](https://igus.eu/chainge)



**New** #assembly

## Let cables live longer

### Universal interior separation system E4Q.64

Further extend cable service life with horizontal and vertical interior separation. The easy-to-install components are now also available for the E4Q.64 series.

- ▲ For safety and ease of assembly
- ▼ Easy filling for the E4Q.64 series, significantly saves assembly time
- Rounded, cable-friendly elements and individually adaptable interior separation increase the service life of the cables
- Have your energy chain recycled at the end of its service life with the igus® chainge® recycling program, regardless of manufacturer: [igus.eu/chainge](https://igus.eu/chainge)



**New** #assembly

## Simple guidance parallel to the chain

### TUB for the E4Q.44/ E4Q.58 and new SHM.60 hose holder

Guide additional cables, hoses, or corrugated tubes parallel to an existing e-chain®. Retrofitting is easy – just install PMA CLIP supports. Sizes from 17-48mm. In addition, a new hose clamp to guide large hoses with 60mm.

- ▲ For laterally guided cables and hoses
- ▼ Quick replacement
- TUB product range for E4.1 and E4.1L systems successfully used in numerous applications
- Have your energy chain recycled at the end of its service life with the igus® chainge® recycling program, regardless of manufacturer: [igus.eu/chainge](https://igus.eu/chainge)



**New**

## Exact positioning

### 64Q.5 notch separator for the E4Q.64

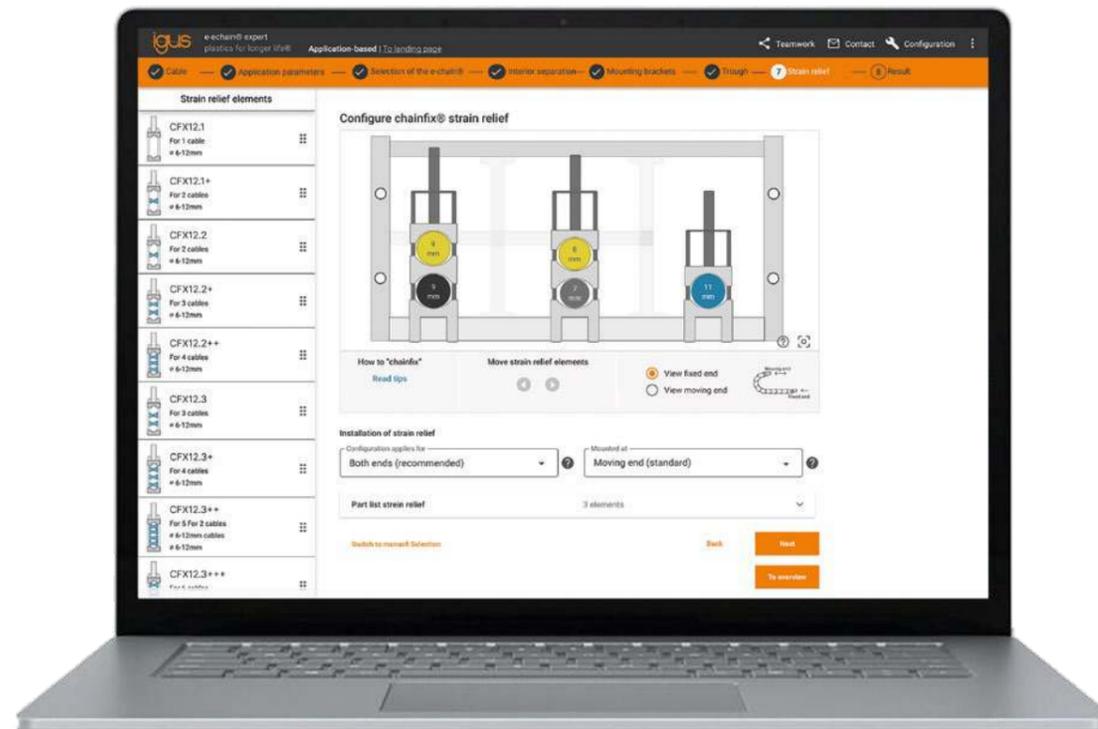
The familiar notch separator from other e-chain® series is now also available for the E4Q.64. Notch separator for exact positioning in e-chains®. Recommended for side-mounted applications. Integrated grid ensures that the interior separation is held firmly in place

- ▲ Integrated grid ensures that the interior separation is held firmly in place
- ▼ More interior separation options for more flexibility
- Known from other modular systems
- Have your energy chain recycled at the end of its service life with the igus® chainge® recycling program, regardless of manufacturer: [igus.eu/chainge](https://igus.eu/chainge)



Configurator for CFX strain relief clamps

# Longer service life



New

## The right strain relief with just a few clicks

Configurator for CFX strain relief clamps

In addition to the condition of the cable, proper strain relief of the cables in an energy chain contributes significantly to a long service life of the overall system. Available from May.

- ▲ Unique design tool offers proper strain relief and thus a longer service life of the overall system
- ▼ Costs of incorrectly designed strain relief are eliminated
- Time savings of up to 50% in design and drawing creation
- 🌱 Continuous further development of the new online tool towards an AI-supported automatic strain relief configuration



New #assembly

## Clip and fix

Strain relief system C825.075.ZS and C1132.080.ZS

The clip-in strain relief - now also for the crossbar of the E4Q series.

- ▲ Flexible strain relief for many cables on the crossbar
- ▼ Quick and efficient strain relief with tiewrap plate and cable tiewrap
- Well-known and proven from many other igus® series
- Have your energy chain recycled at the end of its service life with the igus® change® recycling program, regardless of manufacturer: [igus.eu/change](https://igus.eu/change)



## High holding force, assembled in seconds

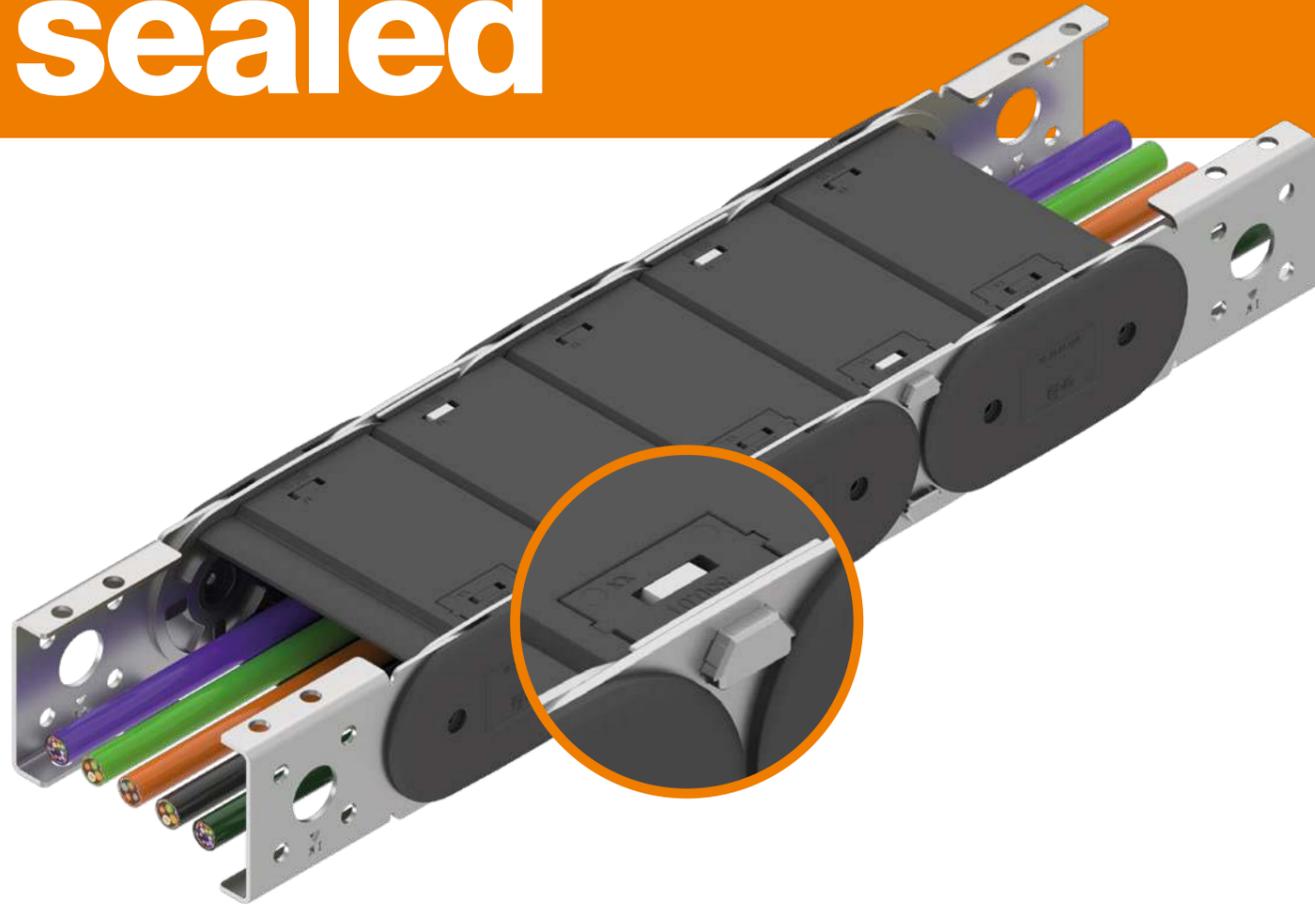
CFU.V strain relief

- Flexible honeycomb design for increased holding force
- Tribologically optimised honeycomb design for the best hold
- Different cables with diameters from 2mm to 17mm can be strain-relieved without problems
- Cables can be replaced easily
- Easy positioning of cables

[igus.eu/CFU](https://igus.eu/CFU)



# Tightly sealed



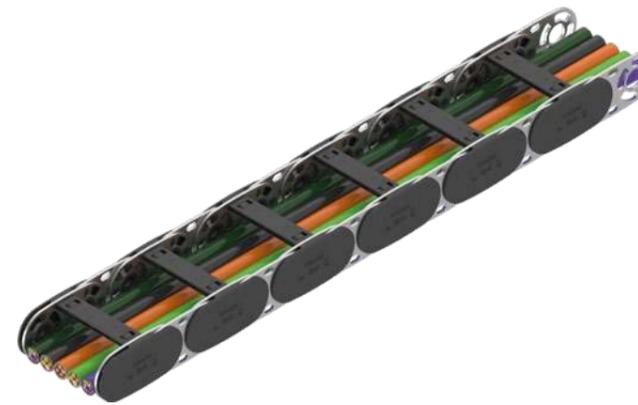
**New** #assembly

## Cost-effective upgrade for existing chains

YR.42 / YR.56

Tech up made easy: with the new horn adapter, the YE hybrid chain series can easily be made swarf-resistant with the lids/bases of the R4.42 and R4.56 series. Without replacing the e-chain®.

- ▲ Swarf-resistant thanks to lids from the existing igus® product range
- ▼ Improve existing applications cost-effectively
- Known from the R4.1 series
- Have your energy chain recycled at the end of its service life with the igus® change® recycling program, regardless of manufacturer: [igus.eu/change](https://igus.eu/change)



**Study** #assembly

## Maximum strength now with lower inner height

YE.28

Expansion of the successful YE product range. igus® hybrid chains (best mix of plastic and steel) in a new size with an inner height of 28mm. YE e-chains® and e-tubes are ideal energy supply systems for machines with elevated axes.

- ▲ Maximum strength: steel inner plates absorb the force of the fixed plastic inner and outer link stop-dogs
- ▼ Easy, fast installation of the YE.28 thanks to the YE series plug-in system. No screws or rivets necessary.
- YE series successful in customer applications with high fill weights
- Have your energy chain recycled at the end of its service life with the igus® change® recycling program, regardless of manufacturer: [igus.eu/change](https://igus.eu/change)

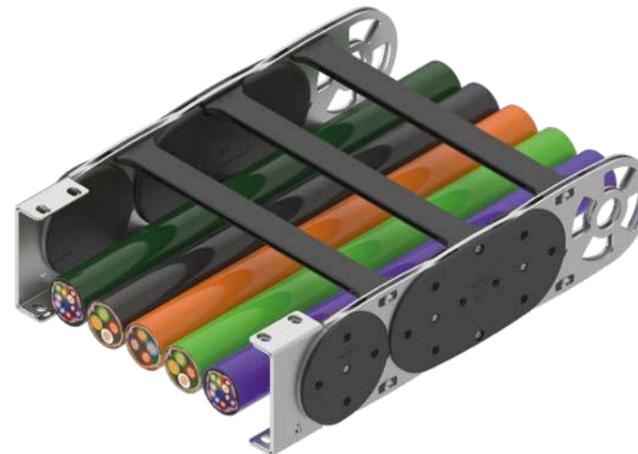


**New**

## Precise chain lengths

YEHD.108/YEHD.112 mounting brackets

Mounting brackets for the YEHD.108 and YEHD.112 can now also be ordered for an even number of links.



- ▲ Offers precise travel lengths
- ▼ Cost down with chain lengths designed precisely for the application
- The YEHD series is already installed in numerous applications and is now even more precise thanks to a new mounting bracket
- Have your energy chain recycled at the end of its service life with the igus® change® recycling program, regardless of manufacturer: [igus.eu/change](https://igus.eu/change)
- 🎯 Online tools for digital configuration and individual service life calculation



# Simply glue to the crane



New #assembly

## Compact solution, super-fast installation

guidelok swing - adhesive version

The compact solution for cable guidance on jib cranes with a travel of up to 10 metres. With the new adhesive version, even more cost-effective and super easy to install securely without drilling.

- ▲ Super-fast and easy installation with adhesive pads and assembly template
- ▼ Reduce assembly time by 70% compared to the assembly of festoons or standard energy chains with guide troughs (no drilling into the crane girder or attaching welding studs)
- The first glued guidelok swing has been in use at our customer Talke Plastic since April 2023, completely trouble-free
- Recycle previously installed energy chains for free through the igus® change® recycling program. No matter what manufacturer.
- 🔗 Online tools for digital configuration and individual service life calculation



### Application example

## Safety for people and machines

The guidelok swing GLO.S cable guidance system from igus enables cranes to travel safely during injection-moulding production of Talke Plastic. Contract manufacturing is highly individual, which means that the required tools have to be replaced regularly depending on the project. For this, the Thuringian specialist Talke Plastic uses crane systems under the ceiling for their injection-moulding production. To ensure that the cranes travel safely and no one is harmed in the process, the company decided to install the guidelok swing GLO.S cable routing system from igus®. The solution wins over customers not least due to the innovative, very simple attachment of the guidance systems by means of adhesive technology.

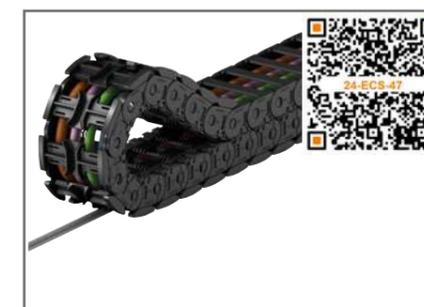


# Further highlights

for material handling and intralogistics



guidelok swing GLO.S.E2i.21.025  
Long travels, high speeds



autoglide 5  
Energy, data, air and liquids in one system



Heavy duty rol e-chain® P4HD.56R  
10m travel on jib cranes

# Order for charging stations



## Study

### Optimum protection for charging cables

#### e-tract DC

Cable retraction system for clean cable management on fast charging stations. Optimum cable protection: no charging cables lying around, no cable damage caused by crushing or driving over the cable.

- ▲ Charging cable is retracted into the charging station without reeling (no heat build-up!) and protected from external influences
- ▼ Prevention of cable damage (the cable is protected in the charging station)
- Tested in the igus® laboratory
- Use of recycled or recyclable raw materials



## Expert interview

### Background to the development of the e-tract DC

**"How did igus® come up with the idea of developing an e-tract for fast charging stations after the e-tract for wallboxes?"**

"In discussions about the e-tract 3.0, there was a frequent request for a cable retraction system for DC fast charging stations, as cables are often damaged when they lie on the ground and are driven over or caught between car tyres and the kerb. Replacing the cables is expensive, and handling is difficult due to the weight and large outer diameter of the cables. According to our customers, the retraction cables or pivot arms previously assembled on the cable were not satisfactory in terms of appearance and technology. With our solution, we have implemented a cable retraction system in the tightest of spaces, which can be attached to the side of the charging station or integrated into it."

**"Are there any other advantages that the e-tract DC offers, apart from the visual reasons mentioned above?"**

"The biggest advantage is that the cable is largely retracted into the charging station when it is not in use. This means that it cannot be driven over or crushed. The cable is conveniently pulled out to the front, which requires significantly less space than a pivot arm."

**"How does the e-tract DC work?"**

"It works via integrated guide rollers, which are assembled on two synchronised carriages that move in opposite directions. The cable is pulled back as with an inverted pulley block. In contrast to a cable drum, we effectively prevent heat build-up in the cable. Regardless of how far the cable is pulled out of the system, it can always be charged at full power. The convenient latching mechanism mechanically relieves the cable during the charging process."

**"What extension length is possible?"**

"This depends on the height of the system. With the 2m high version, we can pull back 3m of cable length. The cable outlet is at an easily accessible height of 1.2m, even for wheelchair users. In addition, up to 2.8m can hang from the charging pole as a loop without touching the ground. The maximum distance we can achieve with the system is up to 5.8 metres."

**"Is the system already available as standard and does it work with all charging cables?"**

"We are currently in the prototype phase and are carrying out functional and service life tests with various charging cables in the laboratory. These tests are already very promising, so we are ready to enter the beta test phase with manufacturers of DC fast charging stations."



**Christoph Koch**  
Product Manager e-chains®

## Study

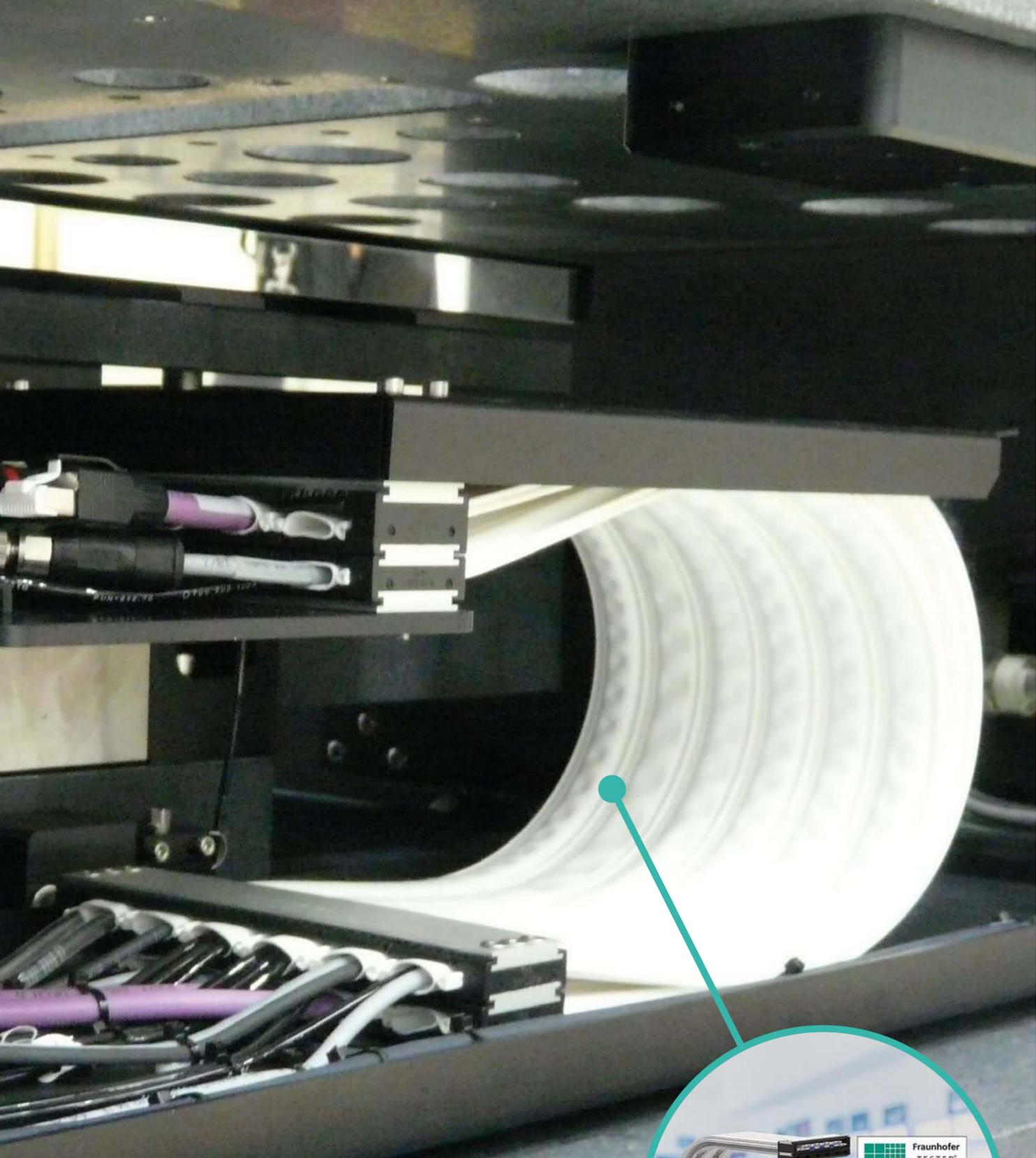
### Compact system, easy to integrate

#### e-tract 3.0 retraction unit

The e-tract for the charging station, reduced to the retraction unit. With mounting holes for easy integration into housings and charging stations.

- ▲ Full charging power even when the cable is rolled up
- ▼ Easy integration into existing structures/systems/installations
- Mechanically tested in climate chambers with temperatures down to -25°C, and electrically tested with integrated charging electronics
- Use of recycled or recyclable raw materials





GO ZERO waste ... sustainable energy supply

# e-chain systems<sup>®</sup> for cleanrooms



Tech up



Cost down



Proof



Sustainability



Digital

## 50

**Optimised design**

C6.38 cleanroom e-chain<sup>®</sup>

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**More space for small cleanrooms**

e-skin<sup>®</sup> soft SKS28.100.02.1

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**Maximum modularity**

e-skin<sup>®</sup> flat single pods now in six sizes

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**Securely fasten single pods**

Mounting bracket for e-skin<sup>®</sup> flat single pods

## 60

**For robots in dry cleanrooms**

triflex<sup>®</sup> R TRC | Fibre-rod system | ESD

## Blog topics

**#cleanroom, page 19**

motion plastics<sup>®</sup> for cleanrooms



## Online tool

**e-skin<sup>®</sup> flat configurator**

[igus.eu/skf-configurator](https://igus.eu/skf-configurator)



## Clean and smooth running

Energy supply system e-skin<sup>®</sup> flat for particle-free semiconductor production in Heidelberg Instruments systems



## Catalogue

Discover everything about our products for cleanroom applications. MAT0075622.20

# [igus.eu/cleanroom](https://igus.eu/cleanroom)

# Cleanroom all-rounder



**New** #cleanroom

## Three inner heights for the highest cleanroom requirements

### C6.38 cleanroom e-chain®

The series offering the highest cleanroom requirements is now available in three inner heights: 29, 38 and 53mm. Optimised with the crossbars every link design in the outer radius and as standard with crossbars plus interior separation made of iglidur® J, the best glide surface for any cable jacket or hose material. The side links made of tribo-optimised low-wear ESD material for dissipative side bands are also standard.

- ▲ The crossbars every link design optimised for cleanroom applications now in three inner heights: 29, 38 and 53mm
- ▼ No static charge thanks to tribo-optimised ESD side links
- Testing during the entire development and approval process in the in-house igus® ISO 1 cleanroom laboratory
- No contamination of production items in the cleanroom by particles
- 🎯 Configurable online in the expert



### Expert interview

## Background of the C6 development



### "Where did the idea of developing a new chain for cleanroom applications come from?"

Kira Weller: "We are a very dynamic company, so almost every week we look for new customer problems to solve. In the large and growing semiconductor market, and in battery production and microelectronics, our six-part energy chain series for cleanroom applications has already been very successful. Then there are our e-skin® and e-skin® flat products, which were developed specifically for this area. But requirements for individual applications are increasing, especially in the semiconductor industry, so we have very often offered special solutions."

### "What were those special solutions?"

Weller: "Things like crossbars and separators made from our iglidur® J material, which reduces the abrasion from parts that come into contact with cables, regardless of outer jacket material. We confirmed this result with many tests in our laboratory. Another special solution, one that customers often request, is electrostatically dissipative energy chains for use in ESD areas. We had already defined a standard product range for these areas, but most of the energy chains were not made for the highest cleanroom classes. So we developed a special solution

made of ESD-compatible material for use with existing E6 chains. In a new generation of the six-part energy chain, we decided to make this special solution electrostatically dissipative ESD material. Its crossbars, side plates, and separators are made of iglidur® J."

### "Were there any other items that you took into account during development?"

Weller: "Yes, we wanted deepen our experience from the previous series. So we decided on the E6.1 series inner and outer link principle. The advantage is that the energy chain has a very straight run. We have also adopted the E6-series crossbar design, which simplifies installation and gives the E6 its quiet operation and very long service life. The crossbars are completely new; our main focus here is on cable-friendliness and simple, tool-free installation."

### "Since 2020, igus® has had its own cleanroom laboratory certified by Fraunhofer IPA. How much does this help you develop cleanroom products, especially the C6?"

Weller: "Our cleanroom laboratory gave us important support. With every prototype change, we carried out particle tests directly and were able to identify and eliminate various particle sources.

We can also take measurements over long periods of time and react quickly. The last change we made was to the number of crossbars in the outer radius. We decided on one crossbar every chain link to make the C6 torsion-proof. If the chain is not guided straight, there can be contact between the individual side links. Then it would no longer be safe to say that we do not generate any measurable particles, and given that cleanroom requirements may continue to increase, we decided on this extra security of doubling the number of crossbars."

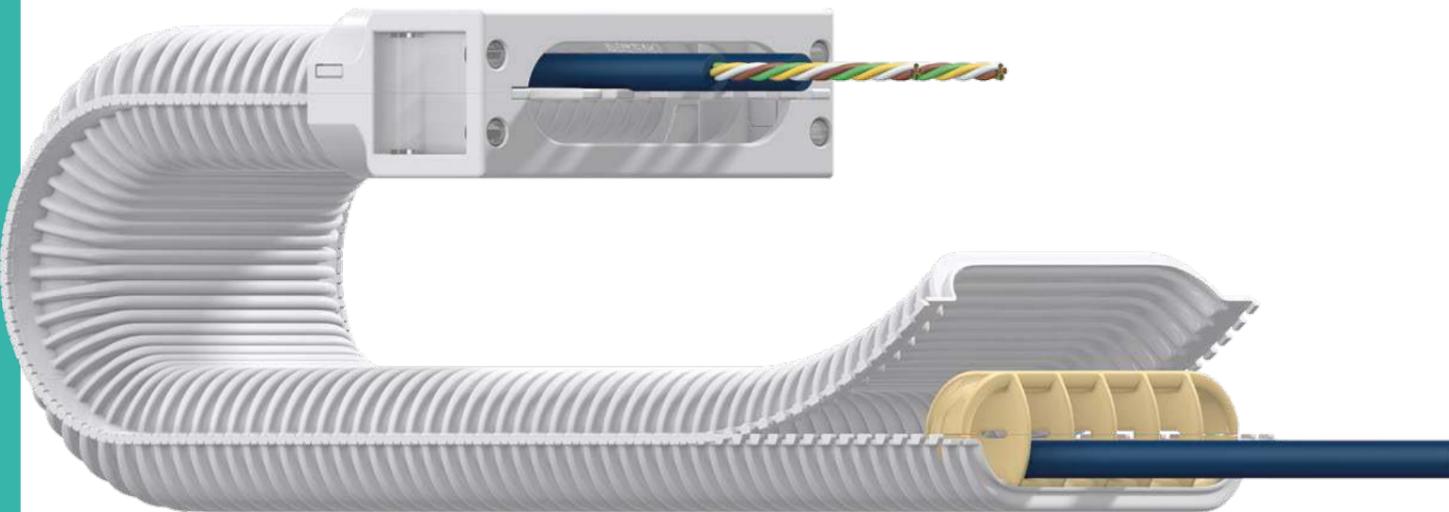
### Now the final question: What does C6 stand for?

Weller: "The C mainly stands for clean – for cleanroom-compatibility. 6 is the number of individual parts that make up an energy chain link. There are two side links, two crossbars, and two crossbars for a total of six. C6 also stands for the series name: Clean-chain."



**Kira Weller**  
Product Manager e-chains®

# More space in small cleanrooms



Study #cleanroom

## Proven design with larger interior

e-skin® soft SKS28.100.02.1

The corrugated tube-like cleanroom energy supply, which consists of an upper and lower shell, is openable and has an unsupported length thanks to the design of the upper shell. Thanks to the specially developed polymer material igumer SKS, the e-skin® soft fulfils the highest cleanroom class. Now available in 100mm width for the version with 28mm inner height. There are now four inner heights: 20mm, 24mm, 40mm and an inner height of 28mm with 2 widths of 68mm and 100mm.

- ▲ 47% more inner width, for more cables with the same inner height
- ▼ Flexible igumer SKS material makes the e-skin® soft suitable for small installation spaces
- Testing during the entire development and approval process in the in-house igus® ISO 1 cleanroom laboratory
- No contamination of production items in the cleanroom by particles
- 🔗 e-skin® soft can be configured online by the expert



### Application example

## e-skin® cleanroom chain in camera module adhesive dispenser



Mingseal uses our e-skin® corrugated tube in its adhesive dispenser for camera modules. It combines the engineers' requirements regarding openability, inherent rigidity and compactness combined with the highest cleanroom suitability according to ISO Class 1.

### Customer requirements:

The company Mingseal manufactures products for the 3C industry (computer, communication and consumer electronics). The main product is an adhesive dispenser for camera modules. In the past, igus® E3 and E6 e-chains® which were already suitable for ISO class 1 according to IPA were in use as energy supply. Nowadays, however, the market demands even greater freedom from particles (and therefore theoretically an even better ISO class) than before, especially for mobile phone camera modules. The reason for this is the ever-increasing number of pixels in mobile phone cameras, because if there is just one particle on these modules, the entire module is abandoned and the overall equipment effectiveness (OEE) and the yield of the system drop enormously.

### igus® solutions:

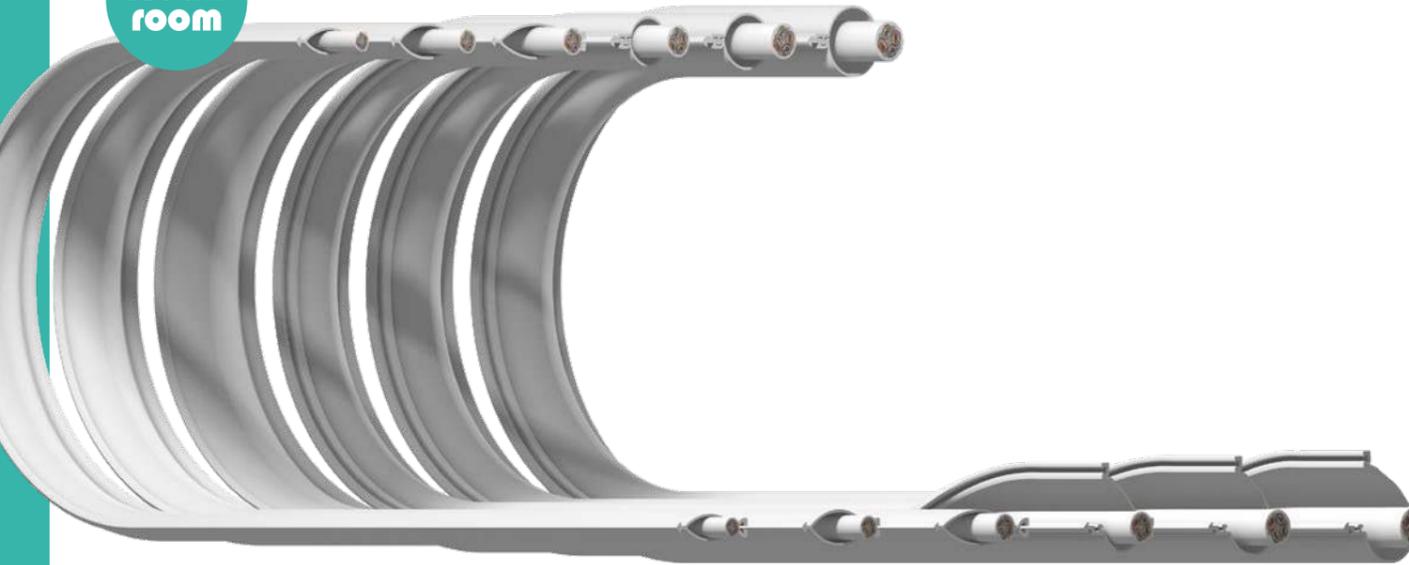
In the first step, the customer had to replace the energy chain with other products, e.g. welded cleanroom ribbon cables. The disadvantages of this solution soon became apparent: firstly, the welded ribbon cables could not be opened to add or replace cables and secondly, the cables broke very quickly because they had to support themselves. After just six months, the first defects appeared on these welded cables, which in turn led to the system coming to a

standstill. The igus® cleanroom energy supply e-skin® convinced the engineers at Mingseal. The unique corrugated tube for cleanrooms, consisting of an upper and lower shell, combined the requirements of the engineers with regard to openability, inherent rigidity, compactness and, of course, the highest cleanroom suitability according to ISO Class 1. In the future, the compact e-skin® SKS20 series will be installed in new machines.

e-skin® flat single pods in six sizes

# Maximum modularity

clean-room



New #cleanroom

## Extended flexibility for the smallest installation spaces

e-skin® flat single pods in six sizes

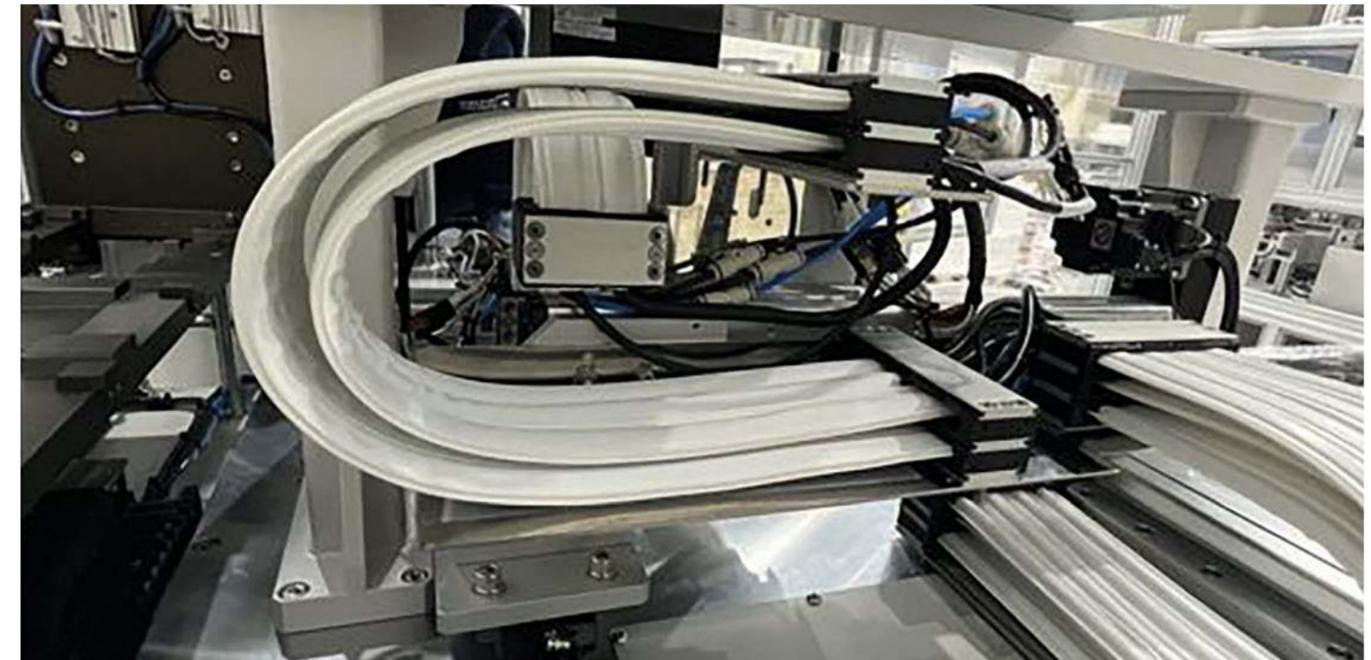
Utilise the smallest installation spaces effectively by combining different single pod sizes with the e-skin® flat. Three additional variants for further flexibility: size SKF10 in openable and closed versions, plus the SKF15 now in openable version.

- ▲ Further variants to optimally utilise the smallest installation spaces
- ▼ All sizes available in openable versions, so cables with connectors can also be easily inserted
- Proven and IPA ISO Class 1 certified e-skin® flat system
- Optimum utilisation of installation space in the cleanroom
- 🔗 Pod assignment simply online via the e-skin® flat tool: [igus.eu/skf-configurator](https://igus.eu/skf-configurator)



Application example

## Multiple axes with e-skin flat in smart phone production



The South Korean company I-MECHA is building a mobile cleaning device for the smart phone production of the world's largest manufacturer in this sector. Its task is to remove copper tip lacquer with a laser. The device must fulfil ISO class 5 cleanroom standards. Therefore, only systems without significant abrasion can be considered for the guidance of energy and data cables. The choice therefore fell on energy chains of the e-skin® flat series from igus® (SKF120.1.1.10) - with

a stroke length of 400mm. According to I-MECHA, reliable and hygienic use improves appliance quality. Another reason why the company decided in favour of igus® was the super-fast service. The energy chain could be retrofitted to machines that had already been delivered. The conversion from an open energy chain to cleanroom flat cables was carried out entirely by the igus® engineering team on site.



**Joonhee Jung**  
e-chain® product manager, igus® Korea Co., Ltd.



**Peter Mattonet**  
Product & Industry Manager Mikroelektronik

### Six variants for maximum modularity



New

- 1 SKF10, closed
- 2 SKF12, closed
- 3 SKF15, closed
- 4 SKF10, openable\*
- 5 SKF12, openable\*
- 6 SKF15, openable\*

\*Simply insert harnessed cables into the openable pods



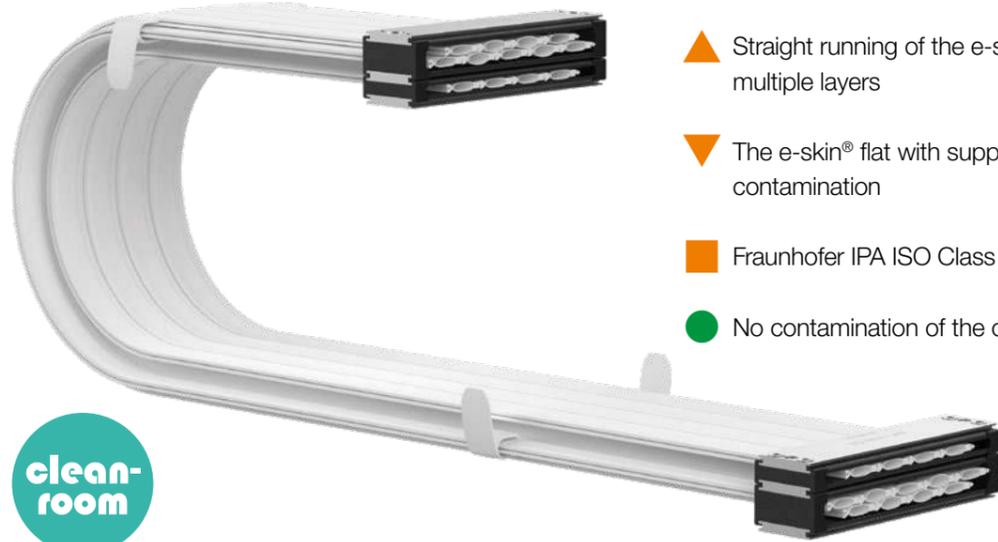
Study #cleanroom

## Straight run guaranteed

e-skin® flat layer holder

The layer holder guides several layers of e-skin® flat straight, even for very long unsupported lengths. The e-skin® flat layers thus remain on top of each other and can utilise the unsupported specifications of the e-skin® flat with support chain, even if they are not installed in every layer.

- ▲ Straight running of the e-skin® flat guaranteed even with multiple layers
- ▼ The e-skin® flat with support chain not required in all contamination
- Fraunhofer IPA ISO Class 1 certified e-skin® flat system
- No contamination of the cleanroom by particles



clean-room



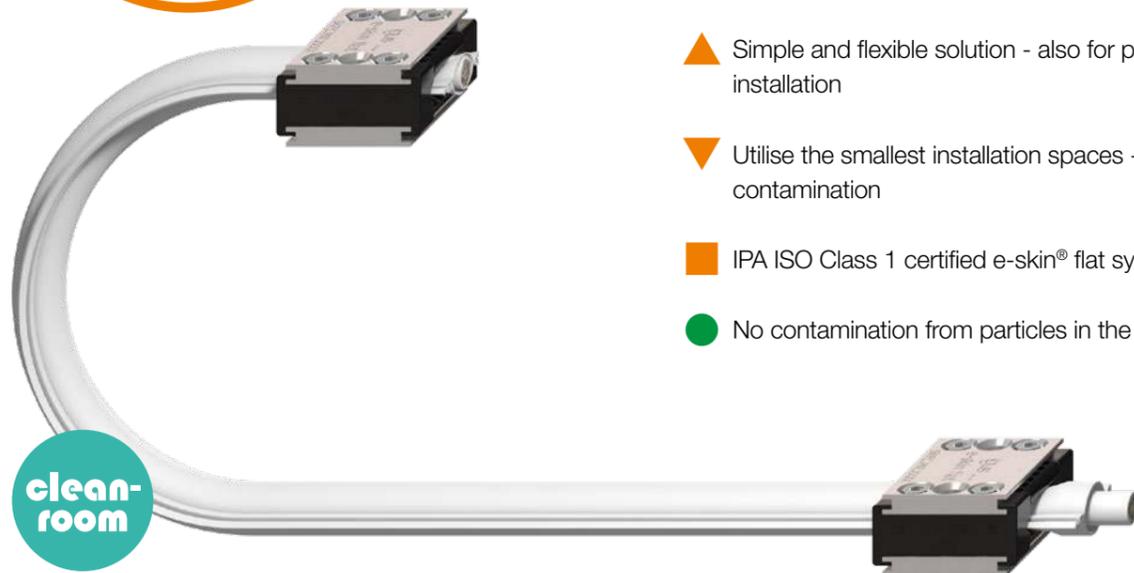
New #cleanroom

## Securely fasten single pods

Mounting bracket for e-skin® flat single pods

Single pods of the e-skin® flat system can now also be easily attached and strain-relieved. This means that individual cables can be guided separately from each other in a pod after the movement, or single pods can be used to organise a string of cables for the smallest movements.

- ▲ Simple and flexible solution - also for permanent installation
- ▼ Utilise the smallest installation spaces - without particle contamination
- IPA ISO Class 1 certified e-skin® flat system
- No contamination from particles in the cleanroom



clean-room

e-skin® soft ESD

# ESD protection for cleanroom ISO 1

clean-room



Study #cleanroom

## Highest cleanroom class, small installation space

e-skin® soft ESD

Proven e-skin® soft now made of dissipative material. This prevents the formation of electrostatic fields and the abrupt discharge caused by the movement of the black e-skin® soft due to the material. The e-skin® soft ESD is suitable for the highest cleanroom class, with a small installation space.

- ▲ A series for all areas, whether cleanroom or ESD area
- ▼ Fewer faults with ESD-sensitive parts, due to abrupt discharge or particles
- Discharge and cleanroom capability tested in the igus® internal (ISO 1 cleanroom) laboratory
- Long service life (more than 10 million double strokes) with low installation space requirements (200mm with a radius of 55mm)
- Configure and calculate the exact service life online





**New** #cleanroom

## Minimise cable abrasion

**e-skin® ring interior separation SK24.3.H.5**

The ring interior separation enables clean distribution of the cables and hoses with minimal abrasion, as it is made from the tribo-optimised plastic iglidur® J. This has proven itself in numerous tests and applications as the best glide surface for any cable jacket or hose material.

- ▲ Cables and hoses separated from each other, neatly guided in the SKS24
- ▼ Longer cable service life thanks to separate chambers in the e-skin® soft
- Reduction of abrasion by 77% (test of various materials in the igus® laboratory) when using iglidur® J
- Sustainability thanks to a longer service life is practical resource protection
- 🔗 Configurable online in the expert



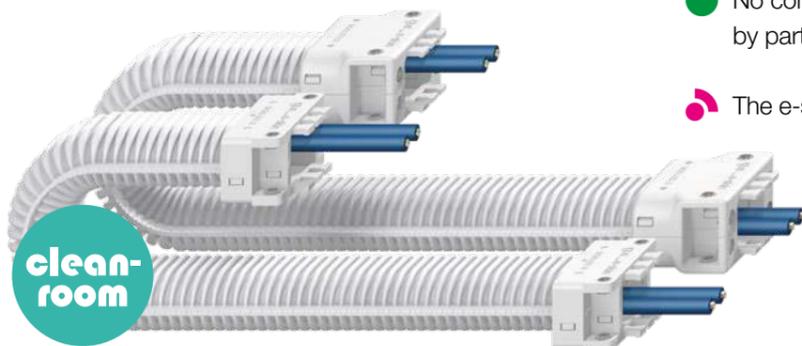
**New** #cleanroom

## Connect more flexibly

**Reinforced mounting bracket for the e-skin® soft 20**

Larger, reinforced mounting bracket as an extension of the accessory options for the smallest e-skin® soft. Can be integrated very flexibly thanks to the additional bushings in front of the head.

- ▲ Another connection option for the smallest e-skin® SKS20
- ▼ Small installation space with the highest cleanroom class
- Fraunhofer IPA ISO Class 1 certification of the identical SKS28
- No contamination of production items in the cleanroom by particles
- 🔗 The e-skin® SKS20 configurable online in the expert



e-skin® SKS24 / triflex® CSCS

# Clean SCARA Cable Solution



**Study** #cleanroom

## Cleanroom compatible for high-speed SCARA applications

**e-skin® SKS24 / triflex® CSCS**

Based on the certified cleanroom Clean SCARA Cable Solution size SKS20, a solution with the next larger e-skin® the SKS24 has now also been developed. The swivel-mounted connections enable use up to ISO class 2 (IPA-certified, in size SKS20). With the e-skin® SKS24, even highly dynamic applications with more filling can be realised. The proven zipper opening principle of the SKS20 / SKS24 enables quick and easy cable filling.

- ▲ Safe guidance of cables and hoses in cleanrooms, easy to retrofit
- ▼ High running performance and reduced downtime (all parts can be replaced individually)
- IPA certificate ISO class 2 and already more than 2,000,000 cycles in the igus® test laboratory of the smaller SKS20 variant
- Individual hoses and cables can be replaced



# For robots in dry cleanrooms



**New** #cleanroom

## Robot energy supply system for dry cleanroom applications

triflex® R TRC | Fibre-rod system | ESD

The triflex® energy chain TRC.40.058.0.ESD combined with the associated fibre-rod system represents the first energy supply for dry room applications that can move in three dimensions. In the context of the increasingly present electromobility, which has become an integral part of our everyday lives, requirements for the automated production of lithium-ion batteries have to evolve continuously.

- ▲ Energy chain suitable for dry cleanrooms and can move in multiple axes
- ▼ Quick and simple assembly due to prefabricated modules
- Dry cleanroom ISO 4-5 certification from the Fraunhofer IPA
- Standard change® material; individual chain links can be replaced. Important contribution to e-mobility



Test report

## TRC.40.058.0.ESD with fibre-rod module



Source: Roman Hickel, Fraunhofer IPA

The system was specifically designed for use on industrial robots to ensure a smooth and ideally contact-free production process. The integrated fibre glass rods serve to stabilise the energy chain up to the fifth axis and prevent contact between the industrial robot and the energy chain. The subsequent TRC energy chain enables the movements to be followed precisely and thus offers

a high degree of flexibility, which is particularly advantageous in dynamic areas of application. With thousands of successful applications in conditions other than cleanrooms, the system has been tried and tested in practice and stands for reliability and efficiency.



**Dominik Barten**  
Development engineer

**Matthias Meyer**  
Head of Business Unit ECS triflex® & Robotics

### Test environment:

The system was tested in a dry cleanroom with a dew point of -40°C, which corresponds to a relative humidity of <1% at room temperature of 22°C and the cleanroom class ISO 3 with three different parameter sets:

Parameters	Cleanroom class (according to ISO 14644-1)
$v_1 = 0.5\text{m/s}; a_1 = 1.0\text{m/s}^2$	4
$v_2 = 1.0\text{m/s}; a_1 = 2.0\text{m/s}^2$	4
$v_3 = 2.0\text{m/s}; a_1 = 4.0\text{m/s}^2$	5
<b>Result:</b>	<b>5</b>

GO ZERO waste ... sustainable energy supply

# In all axes



Tech up



Cost down



Proof



Sustainability



Digital



## 64

**Stronger connection with simplified assembly and disassembly**  
TRE.85.135.0.C

## 68

**One connection, many possibilities**  
Smart support plates / floating moving end

## 72

**For large rotation angles and high filling**  
TRM triflex® rotation module

## 73

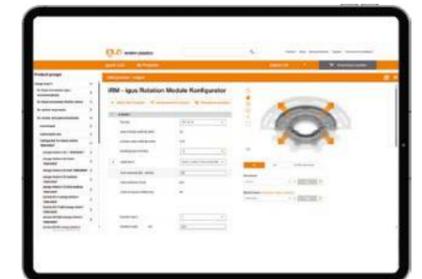
**Compact size plus ratchet, brake and tethering brackets**  
e-spool® theatre 10m and accessories

## 75

**Audio signals with the best quality**  
e-spool® microphone and e-spool® microphone stereo

### Blog topics

#assembly, page 24  
motion plastics® for easy installation



### Online tool

iRM igus® Rotation Module  
Online Configurator  
[igus.eu/irm-configurator](https://igus.eu/irm-configurator)



### Slip ring-free party nights

For an animated ceiling for a nightclub in the Accor Arena in Paris, the designers opted for slip-ring-free spring driven e-spools®, which are fitted with hybrid cables.

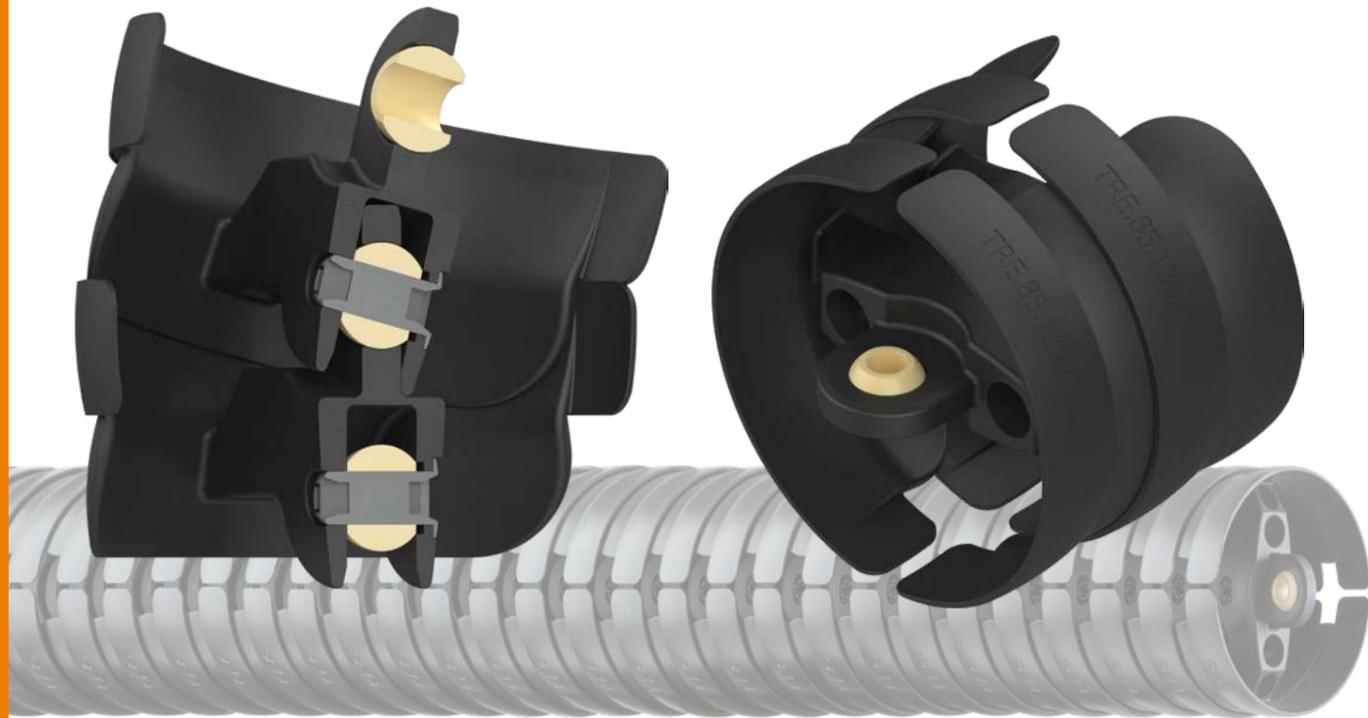


### Catalogue

Available soon: All information on energy chains and energy chain systems. Tested and with up to 4-year guarantee. MAT0075662.20

# [igus.eu/news-ecs](https://igus.eu/news-ecs)

# 20% higher tensile force



**New** #assembly

## Stronger connection with simplified assembly and disassembly

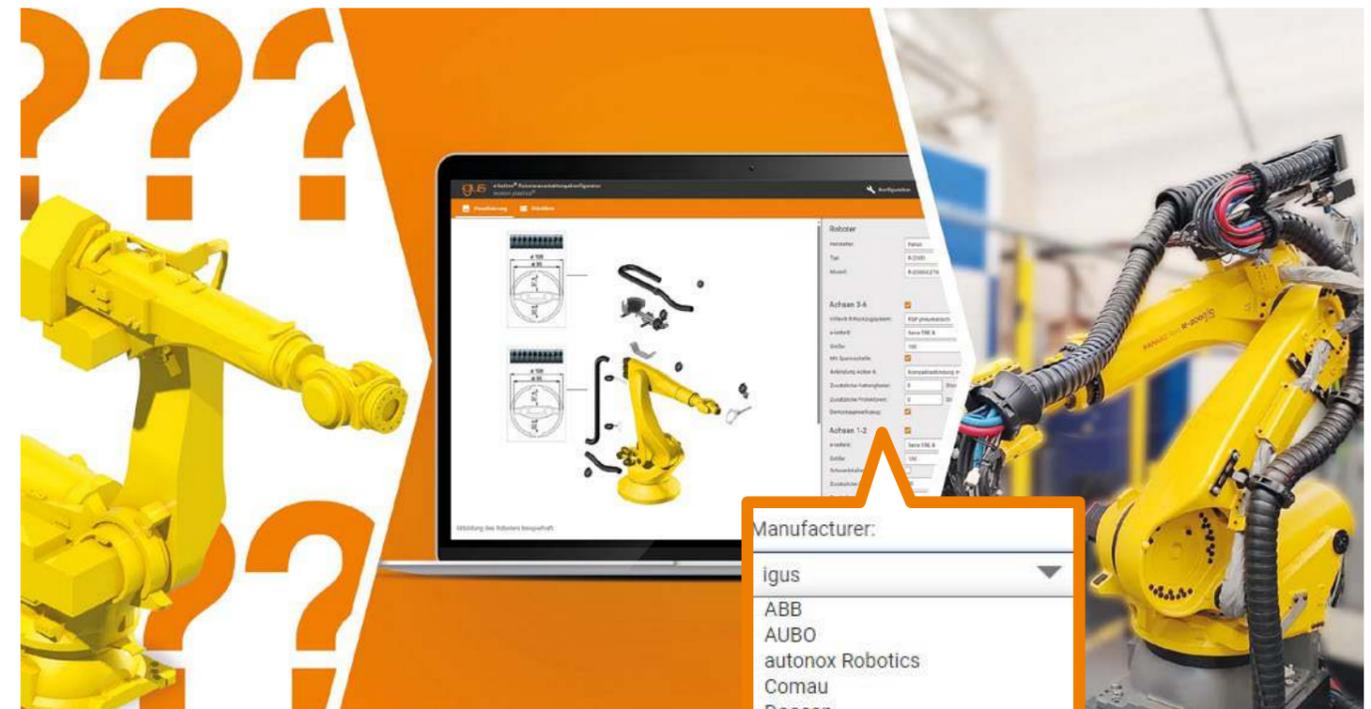
triflex® R TRE.85.135.0.C

Newly adapted connection principle of the pin/bore connection for new possibilities in the field of multi-dimensional energy supply. The advantage: even higher tensile forces and simpler and faster assembly/disassembly. Inner effective area and outer contours identical to the familiar TRE.85.135.0.B, making it 100% compatible with all existing attachments in the triflex® R portfolio in nominal width 85.

- ▲ 20% higher tensile force absorption due to pin/bore principle
- ▼ Quick and easy assembly and disassembly
- Connection principle of the triflex® R energy chain already successfully in use since 2011
- Have your energy chain recycled at the end of its service life with the igus® change® recycling program, regardless of manufacturer: [igus.eu/change](https://www.igus.eu/change)



# 1.5 million configurations



**Update**

## Configure your robot's energy supply quickly and easily

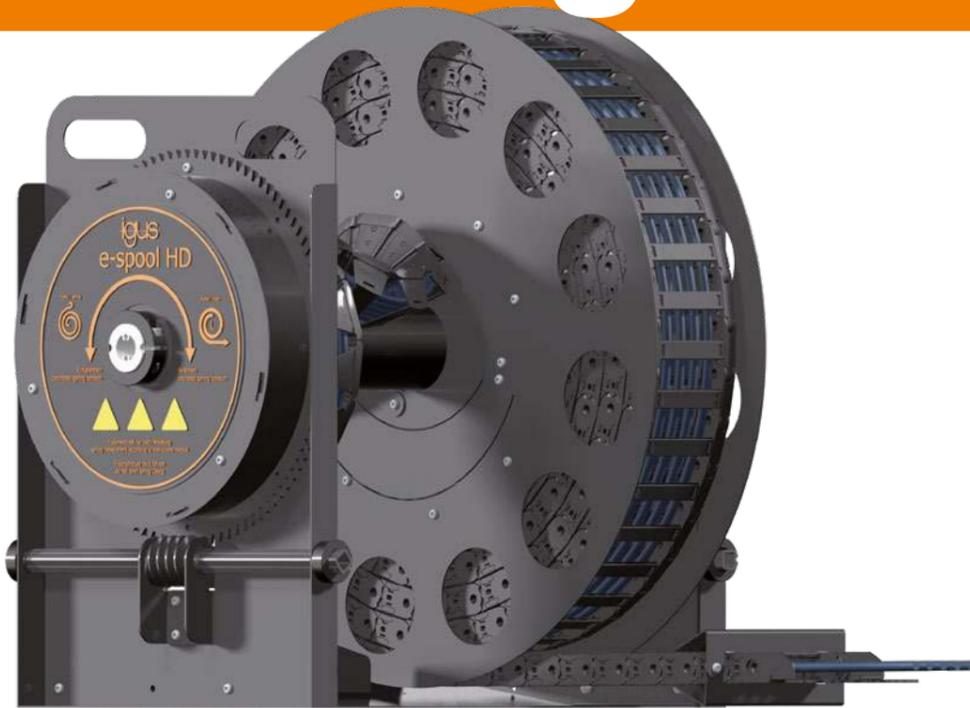
Robot equipment configurator

With more than 500 robot models from 14 different manufacturers, the robot equipment configurator now offers the perfect basis for configuring a suitable energy supply on industrial robots. The clear, simple menu navigation and display enables any user to intuitively select the right energy supply system from more than 1.5 million possible configurations. Example videos and visualisations that change when the configurations are adjusted also support the selection. The energy supply system can be easily expanded and implemented via the links to the 3D download area and the interior separation configurator.

- ▲ Over 500 robot models from 14 manufacturers configurable
- ▼ Time-saving thanks to simple and clear menu navigation
- More than 10,000 call-ups per year
- 1,500,000 configuration options for the right energy supply on the industrial robot [www.igus.eu/erk](https://www.igus.eu/erk)



# Double the fill weight



## Study

### Carry more load, faster, in the smallest of spaces

#### e-spool® 4.0 for crane systems and handling equipment

Guide many different cables in the smallest of spaces, now with 100% more fill weight at higher speeds. The system combines two different energy supply systems: a new tension-optimised e-chain® is guided by a roller and ensures that the energy supply system is always exactly the right length and tension thanks to an integrated retaining spring. In the starting position, the e-chain® is completely rolled up to save space. The twisterband connects the roller to the shaft end block, which serves as an interface to the permanently installed cables.

- ▲ Different media and diameters guided in one system
- ▼ 100% more fill weight and higher application speed compared to previous e-spool® solutions
- twisterband proven as a slip ring alternative in hundreds of e-spool® applications
- Less raw material required due to partial repair option instead of total replacement
- 🌀 Spring force/rotary sensor monitoring (optional)



# Maximised to the minimum



## Study

### Without housing ... for favourable integration into existing structures

#### e-spool® flex light 2.0 for office technology, control panels

The igus® version of a cable drum without slip ring, for cable diameters from 5mm to 15mm. Intended for integration into existing customer structures. By dispensing with an external housing, costs, weight and dimensions can be saved. The e-spool® flex light is planned as a spring-loaded (SP) version.

- ▲ No cable interruption / slip ring-free
- ▼ Adaptable to technological developments by simply replacing the cables used
- Tested in the igus® laboratory
- No additional copper components in the system (apart from cable copper)



# Ready for IoT & smart plastics

# Simply connect the top drive



**New** #assembly

## Standardised connection for long travels

Smart support plates / floating moving end

The new igus® standard for support plates and floating moving ends with identical hole pattern and same attachment height for an even more installation-friendly connection of the e-chain system® to the moving end. The system is supplied with an integrated holder for the strain relief. The i.Sense EC.P push/pull force monitoring system can be ordered as an option or retrofitted at a later date. This significantly reduces downtime costs and continuously increases overall system effectiveness.

- ▲ Safe and easy-to-install moving end connection for travels up to 100m
- ▼ No design and modification work on the moving end when changing from support plate to floating moving end
- Many years of individual references and tests in the igus® laboratory
- Standardised components - easy to retrofit
- 🔗 Can be ordered online in the shop



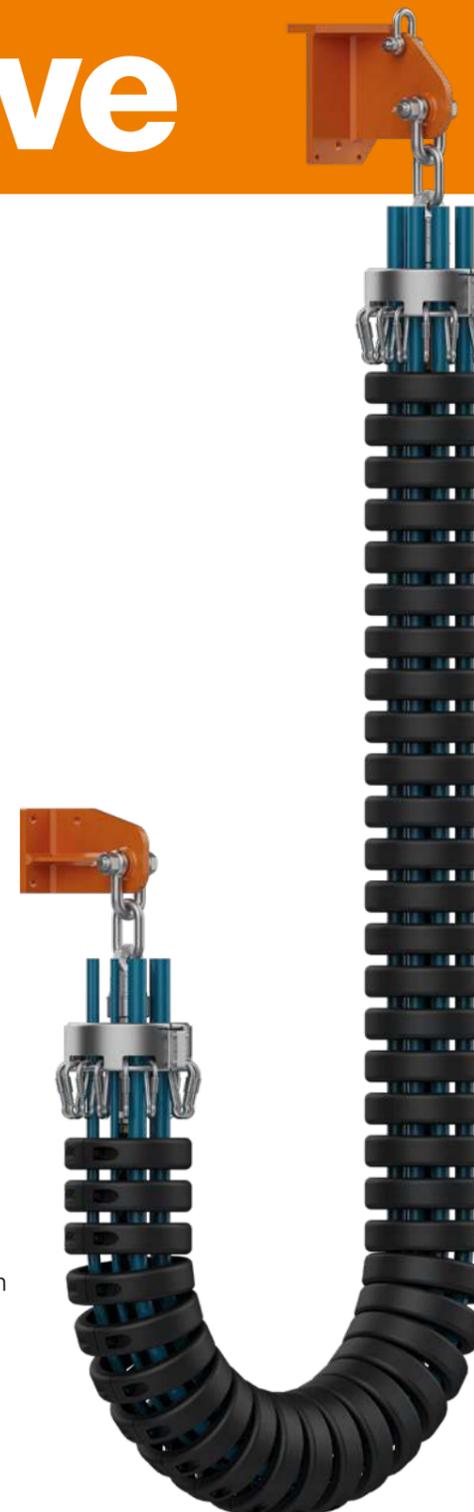
**New** #assembly

## Service loop retrofits in the shortest possible time

e-loop® retrofit console

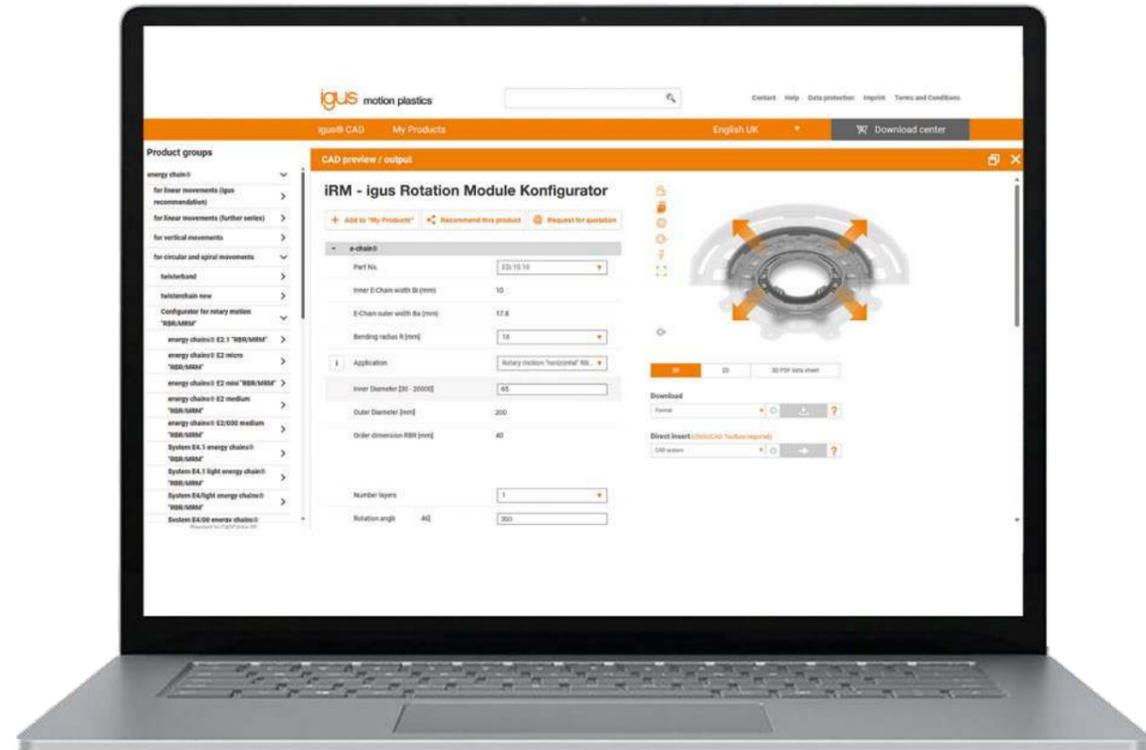
Together with the new retrofit consoles, the e-loop® is a ready-to-connect energy supply system for land drilling rigs. The standardised brackets for easy connection of the moving end and fixed end of the e-loop® ELP.300 to standard top drive models complete the e-loop® portfolio.

- ▲ Quick and easy installation on existing systems: the average conversion time from service loop to e-loop® is eight hours
- ▼ No additional effort for structural and static calculations
- Worldwide references
- Efficient production of identical parts



# Standardised, simple, rotate

# Millimetre precision



**New** #assembly

## Different chain widths in one guide system

### SRM-L Steel Rotation Module Light

Standardised guide segments for different chain widths from 50mm to 250mm. Now available in 12 different trough sizes from an outer diameter of 600mm to 2,500mm as a cost-effective solution for even more turning applications.

- ▲ Simple installation due to fewer components and interfaces
- ▼ Price reduced by up to 40% compared to SRM
- Design modelled on the proven PRM system and tested in the igus® laboratory
- Fewer components and up to 40% less weight compared to the SRM
- 🔗 Can be ordered online in the shop



**New**

## Configure customised rotating energy supply system online

### iRM igus® Rotation Module Online Configurator

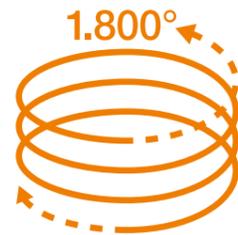
Occasionally, the numerous standards do not fit into the available installation space and a custom rotating energy supply in a different installation size has to be elaborately designed. Configuring the perfect rotating energy supply system for your application is easy and takes just a few seconds - now possible with the new Rotation Module Configurator. With an outer diameter of 200mm to 2,800mm, you receive a finished standard in your desired size, which you can order directly online.

- ▲ Lightning-fast and reliable design of customised rotary modules for your application
- ▼ No additional effort for design and project planning
- Development based on numerous references and tests in the igus® laboratory
- Fewer components / material due to customised configuration
- 🔗 Can be ordered online in the shop



# Easy turning for heavy-duty

# Simple for stage/theatre



## Study

### For large rotation angles and high fill weights

#### TRM triflex® Rotation Module

With five triflex® chains installed, the new TRM offers space for a variety of cables and other media for heavy-duty applications, for example in wind turbines or telescopes. In a compact type (outer Ø 1,300mm, installation height less than 1 metre), a rotation angle of 1,800° can be safely achieved.

- ▲ 1,800° rotation angle in a compact system
- ▼ Save up to 50% installation time on site with the pre-assembled system
- Tested in the igus® laboratory
- Low-maintenance system



## New

### Compact size plus ratchet, brake and tethering brackets

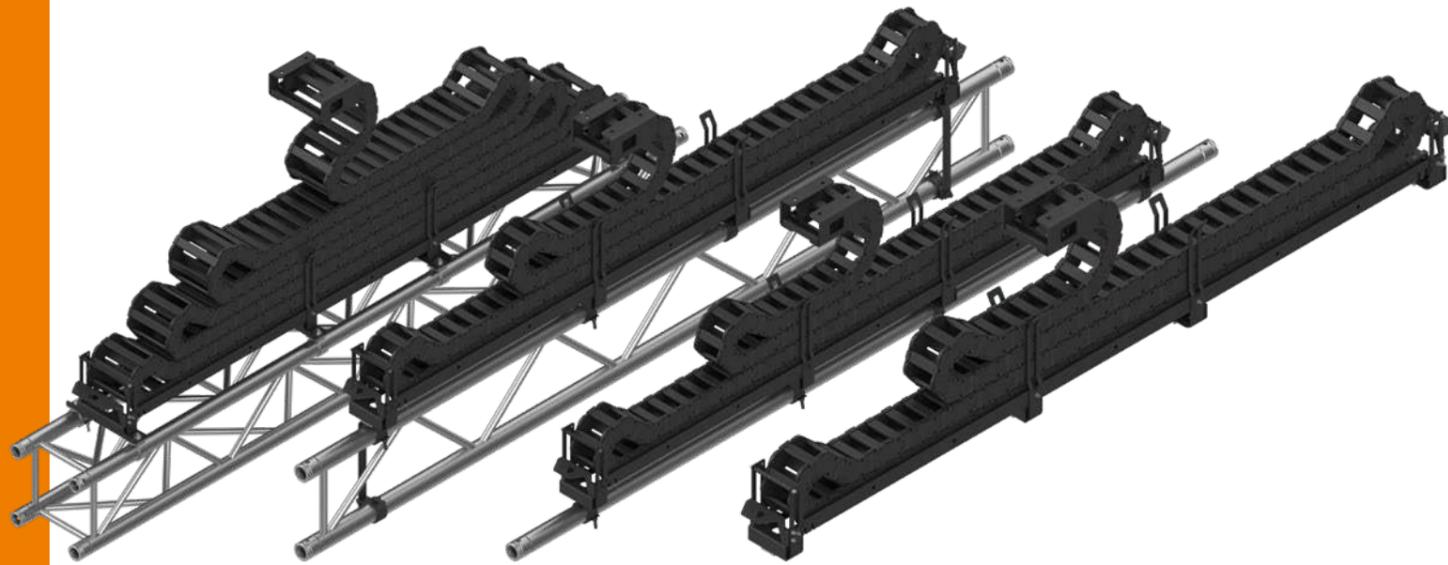
#### e-spool® theatre 10m and accessories

Developed for theatre and stage use in accordance with DIN EN 17206 and DGUV principle 315-390. Since last year, it has become an indispensable standard in theatre and stage technology. A further, more compact size with a travel of 10 metres and the new, optional accessories (ratchet, brake and tethering brackets for ceiling installation) now round off the product range. The extended length of the chain can be individually positioned using the ratchet. The brake ensures controlled winding. The connection brackets help when installing under the customer structure.

- ▲ Guide different media and diameters in one system without a slip ring
- ▼ Design and planning made easy with ready-made 3D models
- Developed following DIN EN 17206 and DGUV Principle 315-390
- Optimised manufacturing process through standardised parts
- Can be ordered online in the shop



# 10m height without basket



New

## Light and cost-effective

### Low-cost zig-zag

All the advantages of an e-chain® with a new guide concept for travel lengths of up to 10m. The system was designed for use on various trusses and based on DIN EN 17206 and DGUV Principle 315-390.

- ▲ Enables higher payloads - with up to 30% weight reduction compared to standard zig-zag
- ▼ Price reduced by up to 30% compared to standard zig-zag
- Developed following DIN EN 17206 and DGUV Principle 315-390
- Material and component-optimised design
- 🔗 Can be ordered online in the shop



# Audio signals with the best quality



New

## Slip-ring-free and compact up to 30m travel

### e-spool® microphone and e-spool® microphone stereo

The microphone motorised winch fills a gap in the field of sound technology and is particularly versatile thanks to its compact size and lightweight feature. The use of the twisterband eliminates the need for a slip ring. Uninterrupted sound transmission can thus be guaranteed for an extension length of 30m. With the e-spool® microphone stereo, two cables are guided in parallel so that two microphones can be connected. Both systems are supplied complete with motor and control system, the e-spool® microphone stereo also comes with a microphone rail for two microphones.

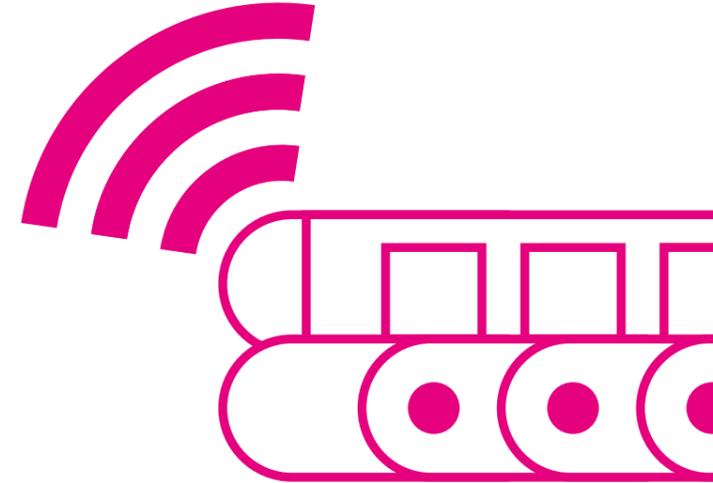
- ▲ Best audio quality without cable interruption/slip-ring-free
- ▼ No additional carrying device required for the microphone
- twisterband proven as a slip ring alternative in hundreds of e-spool® applications
- Contact points and sliding contacts no longer require replacement/maintenance
- 🔗 Optional: control system of up to 256 units possible via one display





GO ZERO downtime ... no unplanned downtime

# smart plastics



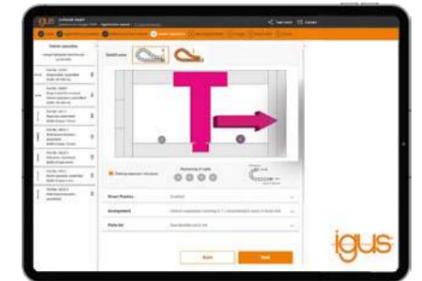
-  Tech up
-  Cost down
-  Proof
-  Sustainability
-  Digital

**78** Contactless condition measurement  
EC.IT

**80** Simple installation and configuration  
superwise iComm box

**82** IoT connection with (OTA)  
update function  
i.Sense module GEN II

**83** Safely monitor bus cables  
CF.D module for bus cables



**Online tool**

**e-chain® expert**  
[igus.eu/e-chain-expert](https://igus.eu/e-chain-expert)



## In ports around the world

The Chinese company Dalian Container Terminal relies on fully harnessed e-chains® with chainflex® cables and smart plastics for its container cranes.



## Catalogue

Available soon: everything to do with smart plastics. Solutions for condition monitoring and predictive maintenance for reduced downtimes. MAT007566420

# [igus.eu/news-smartplastics](https://igus.eu/news-smartplastics)

# Contactless measurement



**New**

## Monitor rol e-chain® during operation and make maintenance plannable

EC.IT

The contactless sensor allows you to detect the condition of your rol e-chain®. And an additional sensor system in the chain is now no longer required!

- ▲ Contactless condition detection for rol e-chains®
- ▼ Retrofit management with percentage status information
- A sensor records the percentage status of the unsupported upper run and sends the data to the Superwise platform or the local i.Cee module
- Extension of the product utilisation time
- 📶 100% transparency in the smart plastics customer portal at all times



**Application example**

### EC.IT: With direct connection to the superwise service

When it comes to maintaining rol e-chain® on long travels, such as those frequently used on container cranes, two points are particularly important: no unnecessary interruptions or risks to ongoing operations, and real-time information on the current condition of the energy supply. This is why igus® has now developed the new EC.IT sensor. This sensor enables simple and efficient condition monitoring of the rol e-chain® during operation without the need to install additional sensors in or on the chain. The contactless status sensor also has a direct connection to the superwise service from smart plastics.

How does it work? Very simple: the sensor is assembled on the trough and detects the condition of the unsupported upper run of the rol e-chain® as it passes by. It measures the percentage status and sends the data directly to the superwise platform or the local i.Cee module. The advantage here is contactless operation, which prevents wear and ensures reliable condition detection. The data is analysed and visualised so that the person in charge of maintenance has an overview of the current condition of the energy supply at all times. The status information predicts exactly how much service life remains



for the rol e-chains® and when the next service call should be scheduled. This extends product utilisation time, avoids unplanned service calls and saves costs. EC.IT condition sensor for roller energy chains is also compatible with superwise silver and superwise gold, the two powerful packages for retrofit management from superwise. With superwise silver, users receive comprehensive condition monitoring of their rol e-chains®, including alarm functions, trend analyses and reporting. The superwise silver package also generates maintenance and replacement recommendations in the igus® cloud,

which are communicated immediately via the igus® service, including appropriate spare parts or maintenance services. With superwise gold, users also benefit from individualised service life statements based on the sensor-based data of the system. The superwise gold converts the status information and anomaly detection in the locally installed i.Cee module into appropriate maintenance messages. The EC.IT contactless condition sensor for roller energy chains and superwise are the perfect combination for smart and sustainable maintenance on long travels.



superwise iComm box

# Integration made easy



New

## Communication module for real-time condition monitoring

superwise iComm box

Once the iComm Box has been easily connected, you can use the dashboard to view the status of your system in real time.

- ▲ Connection to the superwise silver/gold communication module
- ▼ All online costs included in the purchase price for 10 years: no contract, no running costs
- Ongoing test program in the industry's largest test laboratory for dynamic cable applications
- Prevents unnecessary service operations
- 📶 Connection of the i.Sense module via the UART interface, with seamless integration



### Background

## Optimise performance and service life of energy chains

The superwise iComm Box for i.Sense is an innovative solution that makes it possible to connect the intelligent i.Cee and i.Sense sensors to the superwise system. A compact solution that integrates the proven i.Sense condition monitoring into the superwise silver concept. With the superwise communication module, the benefits of smart plastics can be utilised, offering optimum condition monitoring and predictive maintenance of energy chain applications. With the iComm Box, it is possible to monitor the status of systems, make maintenance processes more efficient and obtain important information in real time.

The superwise iComm Box is easy to install and configure. The module then sends the data to the retrofit management system superwise.

### Important features of the iComm Box:

**Installation:** The iComm Box can be easily attached to the switch cabinet. It can be assembled with two-side adhesive tape, NeoDyn magnets or simple screws.



### Seamless integration:

The box is connected via the UART interface of the i.Sense module. It sends aggregated and encrypted data packets to the superwise platform at regular intervals. Intelligent algorithms analyse the data and calculate the estimated system status in the form of a percentage value. This value makes it possible to recognise upcoming maintenance work, product changes or anomalies.

### Dashboard for real-time information:

The clear dashboard displays information such as trend analyses, service life expectancy, system status reports and alarm messages.

### Responsibility and safety:

With the iComm Box, igus® takes responsibility for its products in customer applications. The serial connection ensures security, as there is no access to TCP/IP networks.

**Costs and use:** The data transfer costs are included in the purchase price of the device for at least 1 year. Use of the platform is free of charge.

The iComm Box is a further step towards smart Industry 4.0 solutions for reliable, flexible and cost-efficient communication between your smart plastics sensors and your higher-level system. With the superwise iComm Box, the performance and service life of energy chain applications can be optimised in the best possible way.

### Three service packages

**superwise Silver**

- ... precise statement on the individual application
- ... Call from technical sales with suggested solutions
- ... i.Sense: Alarm or info message when defined values are exceeded
- ... i.Cee: Information is sent via a local network or online to a cloud (IoT)

**superwise Gold**

- ... sensorbased data for precise service life information
- ... Maintenance, inspection and replacement of the energy system run automatically without additional costs

**superwise Basic**

- ... contains component overview
- ... saves installation history
- ... indicates the service life statistically
- ... includes Next-Service-Reminder



**Richard Habering**  
Head of Business Unit smart plastics



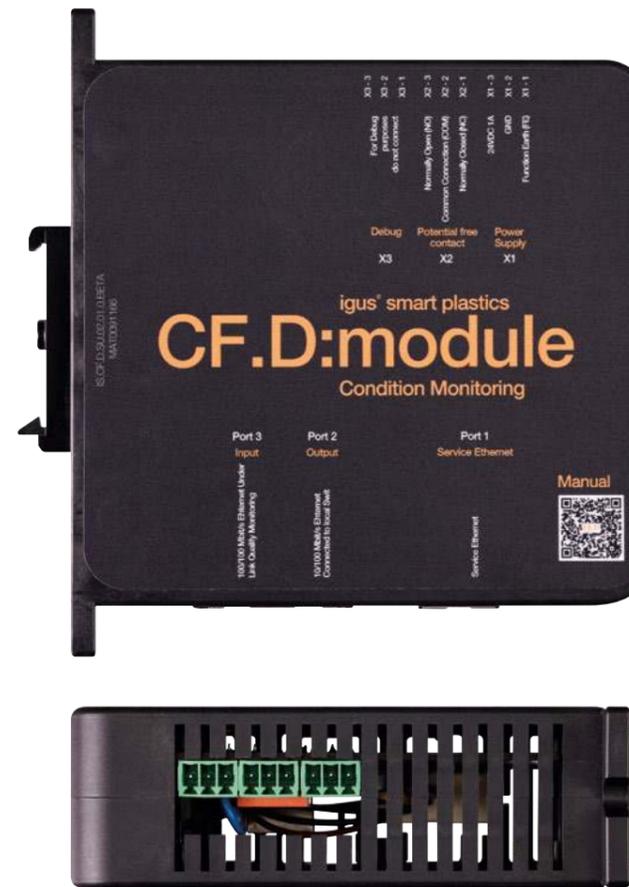
## Study

### IoT connection with (OTA) update function

#### i.Sense module GEN II

This module enables an IoT connection of your system to the superwise portal. i.Sense gives you accurate forecasts and greater operational reliability.

- ▲ OTA update capability for firmware, parameters and remote access
- ▼ Crash prevention through timely anomaly detection
- Ongoing test program in the industry's largest test laboratory for dynamic cable applications
- Service calls can be minimised
- 🔒 Cybersecurity at the highest level: OTA updates ensure that your module always receives the latest security patches and is protected against cyberattacks.



## Update

### Safely monitor bus cables

#### CF.D module for bus cables

The CF.D module is looped into the dynamically loaded bus cable and monitors the transmission properties of the cable on the cores used.

- ▲ Graphical dashboard with event log and history display
- ▼ Quick and easy diagnostics by recording events during operation
- Ongoing test program in the industry's largest test laboratory for dynamic cable applications
- No extra cores needed
- 🔗 Simple configuration thanks to compatibility with DriveCliq plug connection



## Update

### Optimise service life

#### superwise integrated i.Cee module

The i.Cee-integrated superwise maintenance management is the ideal solution for Industry 4.0, guaranteeing maximum system and user safety as well as product service life.

- ▲ Management of customised maintenance plans for gliding e-chains® applications
- ▼ Timely reminder by igus® minimises downtime costs
- Numerous proven smart plastics projects as well as ongoing maintenance contracts
- Prevents unnecessary service operations
- 🔗 Intelligent monitoring of your energy chains and cables with maximum system and user safety



## Study

### High data transfer rate, optimised service life

#### DriveCliq extension for CF.D module

Optimisation of the performance and service life of your cables with high data transmission rates. This extension enables the CF.D module to utilise the advantages of DriveCliq, such as a high data transfer rate, simple cabling and high interference immunity.

- ▲ For TCP-IP, Profinet and Ethercat / DriveCliq (BETA)
- ▼ Lower maintenance costs thanks to comprehensive monitoring of all cables in the network
- Ongoing test program in the industry's largest test laboratory for dynamic cable applications
- Prevents unnecessary service operations
- 🔗 High data transfer rate through expansion with DriveCliq





GO ZERO waste ... sustainable energy supply

# chainflex® cables



Tech up



Cost down



Proof



Sustainability



Digital

## 86

**4 years. Reliable. Unique.**  
New chainflex® guarantee

## 88

**For e-chain® and cable tray**  
chainflex® UL-listed flexible motor  
and control supply cables

## 90

**Hanging securely on top drives**  
chainflex® CFSPECIAL.572

## 92

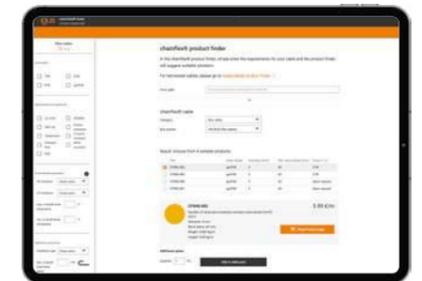
**For dry environments**  
New chainflex® PVC cables

## 94

**Double the service life**  
chainflex® CFCLEAN with a guarantee  
of 40 million double strokes

## Blog topics

**#cleanroom, page 19**  
motion plastics® for cleanrooms  
**#PFAS #PTFE, page 22**  
motion plastics® for  
PFAS-free applications



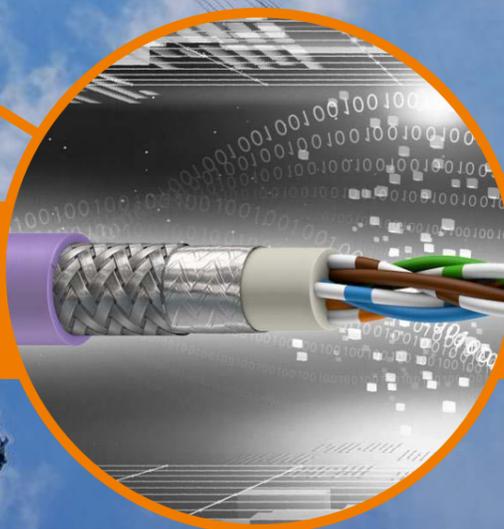
## Online tool

**chainflex® product finder**  
[igus.eu/quickcable](https://igus.eu/quickcable)



## Reach for the sky above Vienna

chainflex® bus cables in suspended e-chain® have ensured smooth operation of the Prater Tower in Vienna since 2010.



## Catalogue

Available soon: all information about chainflex® cables for moving applications. Tested and with a guarantee of up to four years. MAT0075666.20

# [igus.eu/news-chainflex](https://igus.eu/news-chainflex)

# 4 years. Reliable. Unique.



**New**

## 12 months additional guarantee for more security

### 4-year chainflex® guarantee

The unique chainflex® guarantee is now extended to 4 years. The clear statements on the guaranteed service life give the customer additional planning safety.

- ▲ Planning safety thanks to a guarantee that is four times longer than the statutory warranty
- ▼ Additional reduction in unplanned downtime saves time and money
- Exact guarantee statement based on billions of test cycles in the largest test laboratory (4,000m<sup>2</sup>) in the industry
- Sustainability thanks to a longer service life is practical resource protection, enhancing economic efficiency and protecting the environment
- 🔗 Calculate the cable service life online: [igus.eu/chainflexlife](https://igus.eu/chainflexlife)



## Countless test series in the UL-certified chainflex® test laboratory combined with practical experience Predictable safety and more sustainable products

Functional reliability is essential, both operationally and financially. Studies such as "The True Cost Of Downtime" (Source: Siemens, 2023) show that large factories lose an average of 323 production hours per year due to machine failures.

In today's age of raw material scarcity and climate change, the issue of sustainability in products and plants is becoming important. Especially in the selection of suitable components. Example: the failure of a cable in a moving application leads to downtime, losses and high maintenance costs. Until now, the environmental impact of these failures has often been neglected.

For example, when producing a 4x1.5mm<sup>2</sup> PUR motor cable, approx. 298 kilograms of CO<sub>2</sub> are emitted per kilometer. If this motor cable needs to be replaced, the following avoidable CO<sub>2</sub> emissions are generated:

- For new production
- For disposal
- For replacement

The correct design of a cable and its guaranteed service life actively contribute to sustainability and climate protection. We offer a unique 4-year guarantee (previously 3 years) on all chainflex® cables in the catalogue to ensure planning reliability.

### The largest test laboratory in the industry

This is only possible because igus® has amassed more than 30 years of experience and an enormous amount of test data in the largest laboratory for cables and e-chains® with a 4,000m<sup>2</sup> floor area. This enables the generation of reliable statements about the durability and service life of a chainflex® cable.

The chainflex® laboratory carries out special tests under realistic conditions and collects data from over two billion test cycles with more than 1.4 million electrical measurements every year.

Continuous monitoring and documentation are carried out on 65 test systems with professionally qualified personnel. The

e-chains® with cables are tested on a wide variety of travels, in horizontal or hanging applications. The same applies to the multi-axis triflex® systems in conjunction with chainflex® CFROBOT cables, where the focus is particularly on torsion resistance.

This basis of practical experience and test laboratory made the unique chainflex® guarantee possible.



**Rainer Rössel**  
Head of Business Unit chainflex® cables

### Data on the chainflex® test laboratory

- The industry's largest test lab for moving cables
- 30 years of experience
- 4,000m<sup>2</sup> test area
- 65 test stations
- 800 tests conducted in parallel
- 2 billion double strokes per year
- 1.4 million electric measurements per year
- Audited and certified by Underwriter Laboratories (UL)



# For e-chain® and cable tray



Guarantee  
igus chainflex

4

YEARS

up to 4 years guarantee

igus 4-year  
chainflex cable  
guarantee and  
service life  
calculator based  
on 2 billion test  
cycles per year

WITHOUT

... Packaging costs  
... Minimum order quantity  
... Cutting charges

From 1 meter & from stock

chainflex

**New**

## From the e-chain® straight onto cable tray

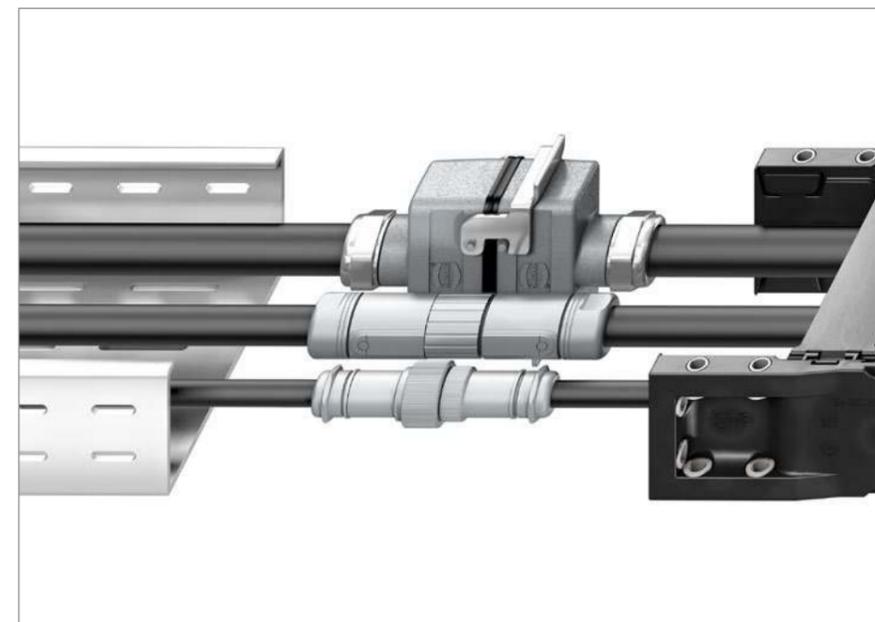
chainflex® UL Listed Flexible Motor Supply Cable

Unique TC-ER motor cable (CF33.UL) and control cables (CF150.UL/CF160.UL) for use in the e-chain® and cable tray. There is no need for an interface from the energy chain, as a seamless transition of the cable from the chain to the cable tray is now possible! Tested with a chainflex® guarantee of up to four years.

- ▲ A cable for cable tray and e-chain® with a guaranteed 10 million double strokes
- ▼ Double storage costs for cables specifically for fixed installation on cable tray are eliminated
- UL certification (see right page for details)
- Simplified scheduling and storage: only one type of cable is used for the chain and fixed installation
- 🔗 Calculate the cable service life online: [igus.eu/chainflexlife](https://igus.eu/chainflexlife)



Thanks to the "UL Listed" certification, there is no need for an interface between the e-chain® and the cable tray  
**Listed motor and control cable for continuous movement**



The CF33.UL motor cable and the CF150.UL control cable are additions to the chainflex® product range of shielded PVC motor and unshielded control cables. With the CF160.UL, we also offer a shielded PVC control cable as a catalogue product. And thanks to the 4,000m² chainflex® test laboratory, you will also receive precise information about the service life of the energy chain for this cable with a four-year chainflex® guarantee – in contrast to all other TC-ER cables available on the market!

There is always a lot of confusion in the market when it comes to "UL for cables". There are basically two terms that need to be clarified:

**UR = UL Recognized (AWM)**  
**UL = UL Listing**

The good thing that can be said, however, is that "UL Recognized" or AWM cables are no better or worse than UL Listed cables. AWM is another type of UL certification. This allows a greater variance than UL Listed cables. And this variety of AWM cables enables customers to better cover a wide range of applications, especially in the moving/dynamic application area.

This is completely different from the UL-listed cables: these certifications offer a very limited structure and therefore application variance. This is because the cables are usually only defined and certified for very specific applications. In Europe, this can be compared very well with the term harmonised cables. Here too, there are clear standards and application limitations.

To fulfil customer requests for listed motor and control cables, igus® is now offering UL-/TC-ER-listed and shielded motor cables as well as unshielded and shielded control cables for the first time. In other words, cables that, according to UL's certification concept, are really intended for permanent installation on the cable tray.

Approval: UL Listed, Type TC-ER. (Tray Cable for Exposed Run.)  
But in addition: developed and tested for moving applications in the energy chain!

**What is special about the igus® solution?**

Actually, these listed cables are only intended for fixed installation or occasional movement. For the first time, the combined chainflex® design offers listed TC-ER motor and control cables for continuous use in an energy chain!

**The advantage** is that once the energy chain has been installed, the customer can simply continue fitting the cable on the cable tray. And you no longer have to provide an interface between the energy chain and the cable tray, as was the case in the past.



**Nils Jäger**  
Business Development Manager  
chainflex® cables

**UL**  
Flexible Motor Supply Cable UL 2277  
XHHW-2 UL 44  $\geq 2.5\text{mm}^2$   
FFHH-2 UL 66  $\leq 1.5\text{mm}^2$   
TC UL 1277  
AWM 20886

**Specifications:**  
OIL RES I / SUN RES  
90°C wet  $\geq 2.5\text{mm}^2$   
90°C dry  $\geq 2.5\text{mm}^2$   
75°C dry  $\leq 1.5\text{mm}^2$   
DIR BUR  $\geq 2.5\text{mm}^2$



# Hanging securely on top drives



**WITHOUT**

- ... Packaging costs
- ... Minimum order quantity
- ... Cutting charges

From 1 meter & from stock

**New**

## Operational safety in the onshore and offshore sectors

### chainflex® CFSPECIAL.572

Expansion of the chainflex® special motor cables CFSPECIAL.572 to the larger portfolio available from stock for suspended top-drive applications. With DNV approval for use in the maritime sector.

- ▲ Complex and special cable design with aramid braid, for applications under extreme conditions
- ▼ Reduce project certification costs thanks to DNV approval for the entire CFSPECIAL.572 series
- Complete documentation of eligibility criteria and test procedures
- Due to on-demand delivery, excessive cable waste is avoided



### Background

## Special cables for top drives

The chainflex® control cable CFSPECIAL.572.25.37 and motor cable CFSPECIAL.572.40.07 are an addition to the cable range for the maritime sector. They have been specially developed and tested for top drives, i.e. for applications on onshore and offshore drilling rigs. This means that igus® now offers nine chainflex® cables specifically for top-drive applications - available from stock, from 1m.

Protected by a robust, jet-black PUR outer jacket with aramid support elements, it is MUD-resistant in accordance with NEK 606.

In combination with the igus® e-loop®, this cable series offers the highest level of safety that is required on drilling rigs. Because if you have to drill in extremely tough surroundings, you are talking

about a lot of effort and investment. And a system failure is expensive.

### Advantages of e-loop® with CFSPECIAL.572

1. A compact system instead of several service loops.
2. Clearly defined bend radius of the system and protection of the cables in strong winds with the e-loop®.
3. So modular that cables can be easily added or replaced.
4. A series of cables specially developed for this application (amounting to nine cables) with integrated aramid support elements.

igus® is now the first provider of e-loop® cables with DNV approval, which offers the user a higher level of confirmed functional reliability.



**Tim Schneebeck**  
Industry Manager  
Offshore / Oil & Gas



**Katharina Wielpütz**  
Business Development Manager  
chainflex® cables

# Further highlights

## for onshore and offshore use on top drives

**CFSPECIAL.572 single cores and CFSPECIAL.532 data cable**  
Safety for top drives

**e-loop® system**  
Safe cable guidance on top drives

**igutex® TX plain bearings**  
Developed for very high loads

New chainflex® PVC cables

# For dry environments



Guarantee  
igus chainflex

4

YEARS

up to 4 years guarantee

igus 4-year  
chainflex cable  
guarantee and  
service life  
calculator based  
on 2 billion test  
cycles per year

WITHOUT

... Packaging costs  
... Minimum order quantity  
... Cutting charges

From 1 meter & from stock

chainflex

**New**

## Cost-effective, tested and guaranteed

New chainflex® PVC cables

Expansion of the product portfolio to include highly abrasion- and bend-resistant PVC cables in three chainflex® series: CF886 motor cable, CF210.UL servo cable and CF220.UL.H hybrid cable. Ideal for use in dry environments (e.g. woodworking, packaging machines). Tested with a chainflex® guarantee of up to four years.

- ▲ Use of smaller motors thanks to the addition of 0.75mm<sup>2</sup> cross sections to the product range
- ▼ Reduction of the cables used by 50% and smaller installation space for the connector technology thanks to hybrid and compact cable designs
- Test No. 5123: CF886 with over 10 million strokes successfully tested in a 250mm chain radius
- Sustainability thanks to a longer service life is practical resource protection, enhancing economic efficiency and protecting the environment
- 🔗 Calculate the cables service life online: [igus.eu/chainflexlife](https://igus.eu/chainflexlife)



Flexible cables with PVC outer jackets

## The right choice for oil-free applications

If cables in the energy chain are used in dry environments, choosing the right outer jacket material is crucial. Typical sectors for PVC cables include woodworking, packaging and material handling. In these areas of application, there is no high exposure to oils or cooling lubricants.

With the current addition to the product range, igus® is supplementing the chainflex® cable series CF210.UL (servo cable), CF886 (motor cable) and CF220.UL.H (hybrid cable). Thanks to the highly abrasion- and bend-resistant PVC outer jacket, the cables are ideal for moving e-chain® applications in dry environments.

### Advantages of PVC over PUR

#### Higher abrasion resistance and up to 25% more cost-effective

In the dry applications described, PVC is the optimal choice. The material is up to 25% more cost-effective.

#### Tested and with guarantee

All cables are tested in the 4,000m<sup>2</sup> igus® laboratory. With UL AWM approval, UL-verified and up to four years chainflex® guarantee.

#### Available from stock

The cables are available from stock and ready to ship within 36 hours, with no cutting and packaging costs or low-quantity surcharge. On request also harnessed with suitable connectors.



# Further highlights

for dry environments

**Measuring system cable**  
chainflex® CF211  
PVC cable for medium duty applications

**readycable® drive cables**  
suitable for 38 manufacturers

**drylin® W profile guides**  
Lubrication-free linear profile guides

# Double the service life

# chainflex® is PFAS-free



Guarantee  
igus chainflex

**4 YEARS**

up to 4 years guarantee

igus 4-year  
chainflex cable  
guarantee and  
service life  
calculator based  
on 2 billion test  
cycles per year

**WITHOUT**

... Packaging costs  
... Minimum order quantity  
... Cutting charges

From 1 meter & from stock

chainflex

**New** #cleanroom

## Even more safety for cleanrooms

chainflex® CFCLEAN with a guarantee of 40 million double strokes

Doubling the guaranteed service life of CFCLEAN cable elements to 40 million double strokes while increasing the current carrying capacity.

- ▲ Double guaranteed service life of 40 million double strokes with a radius of 70mm
- ▼ Reduction of the cross section through higher current carrying capacity of the core
- Test 5497: Interim status: 130 million strokes (test continues successfully)
- Sustainability thanks to a longer service life is practical resource protection, enhancing economic efficiency and protecting the environment

🔗 Calculate the cable service life online: [igus.eu/chainflexlife](https://igus.eu/chainflexlife)



**New** #PFAS #PTFE

## Operational safety guaranteed worldwide

New logo for chainflex® cables

The new logo confirms that 95% of igus® chainflex® cables are already free of PFAS. This ensures their use worldwide without any restrictions - today and in the future.

- ▲ Use of PFAS-free materials in the production of 95% of igus® chainflex® cables
- ▼ No replacement or disposal: use of chainflex® cable in existing machines and new systems guaranteed worldwide without any concerns/restrictions
- According to the content of the REACH directive and its rules for the production and processing of chemical substances
- Avoidance of high environmental impact and health risks caused by the disposal of perfluoropolymers



# Easy to refill



# Other new products

Tested and with a 4-year guarantee



## New

### Replacing cables in the chainflex® CASE made easy

#### chainflex® CASE Refill

Thanks to the new refill element, the chainflex® CASE shipping and storage solution becomes even more practical and sustainable.

- ▲ Easy refilling of the cable by replacing the reel, saving time-consuming logistics processes
- ▼ Save up to 38% with every reorder of cables sold by the metre for an existing chainflex® CASE
- Tested and developed in collaboration with our customers
- Save up to 2.6kg of packaging waste with every refill order



**CF140.05.04.UL**  
Control cable  
PVC cable  
for medium duty applications

**CF150.UL.15.25**  
Control cable  
TC-ER  
(Power and Control Tray Cable)

**CF211.PUR.03.06.02**  
Data cable  
PUR data cable  
for heavy duty applications

**CFLG.12LB.9/125**  
Fibre Optic Cable  
TPE Fibre Optic Cable  
for heaviest duty applications

**CF211.007**  
Measuring system cable  
PVC cable  
for medium duty applications

**CF330.2400.01.D**  
Spindle cable/Single core  
TPE cable  
for heaviest duty applications



GO ZERO waste ... sustainable energy supply

# readycable® readychain®



Tech up



Cost down



Proof



Sustainability



Digital

## 100

**Now suitable for 38 manufacturers**  
readycable® cables for drive technology

## 102

**EPLAN macros up to date**  
Update to the EDS24 standard

## 103

**Ready for the future**  
CAT8 connectors for the data  
transmission of tomorrow

## 103

**More options for Single Pair Ethernet**  
New connector for SPE readycable® cables

## 104

**Easy to attach**  
Attachment housing for Module Connect

### Blog topics

**#assembly, page 24**  
motion plastics®  
for easy assembly



### Online tool

**readycable® finder**  
[igus.eu/readycable-finder](https://igus.eu/readycable-finder)



### Strictest cleanliness standards

Fully harnessed readychain® systems operate with low vibration and electromagnetic compatibility in machines for manufacturing high-quality medical devices.



### Catalogue

Available soon: everything about ready-to-connect cables.  
Tested and with a 4-year guarantee. MAT0075667.20

# [igus.eu/news-readycable](https://igus.eu/news-readycable)

# Now suitable for 38 manufacturers



## New

### Additional expansion of the drive technology product range

readycable® cables for drive technology

We already expanded the readycable® product range for drive technology with cables suitable for the manufacturers Bonfiglioli, KEBA, Danfoss and MOOG for the SPS in autumn. Now we have added four more manufacturers: **Koco Motion, Schunk, Heidrive and Motor Power Company**. This means that ready-to-connect and fully tested cables suitable for 38 manufacturers can now be delivered in 5 working days. In customised lengths, no minimum order quantity.

- ▲ The seven qualities always give you the most cost-effective cable that is guaranteed to work in your application
- ▼ Reduce storage space: delivery in 5 business days, to your required length, no minimum order quantity, no cutting charges
- 100% tested (test seal of approval and test report)
- Individual service life calculation, exactly what you need
- 🔗 Get the right drive cable in just two steps, online: [igus.eu/readycable](https://igus.eu/readycable)



## A look into the readycable® factory

### Industrial harnessing, no minimum order quantity

Standardised procedures, automated production and lean processes. With these, the readycable® service offers consistently high quality in harnessing – for high-volume orders as well as for customised manufacture with no minimum order quantity. No matter what we produce and no matter in what scope: process, throughput time, quality and improvement for the customer determine our success. Thanks to a wide range of production methods (crimping, soldering, screwing, clamping etc.) and the constant adjustment of even small parameters, we are able to adapt to each customer individually.

"The vision of the factory without hand tools forces us to rethink and optimise all steps in cable harnessing. This enables us to achieve an excellent level of quality



**Christian Stremlau**  
Head of the readychain® and readycable® division



**Markus Hüffel**  
Product Manager readychain® & readycable®

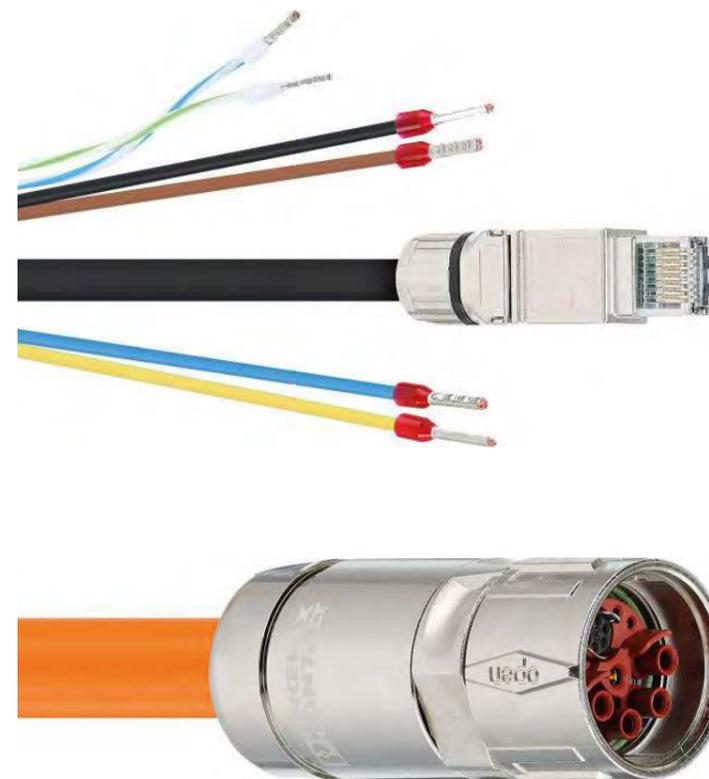
while reducing throughput times," says Christian Stremlau, Head of the readycable®/ readychain® Business Unit at igus®.

**100% testing of each harnessed cable**  
In 2022 alone, we manufactured around 800,000 harnessed products, each one of which was 100% tested: high-voltage

test, digital I/O test, transmission rate (CAT), damping test – everything is carried out in our in-house test facilities.

We always have over 6,000 different connector types from well-known manufacturers (TE/Intercontec, Harting, Binder, Yamaichi, to name just a few) in stock. Thanks to the close cooperation, we have found preferred suppliers to whom we have tailored both our production processes and our machinery.

"Large storage capacity for more than 1,300 different chainflex® types and more than 6,000 plug-in connectors coupled with machine-supported cable harnessing with no minimum order quantity guarantee high availability and low prices for our customers," sums up Markus Hüffel.



## New

### Suitable for Beckhoff, Festo and Heidenhain

Expansion of ready-to-connect drive cables

Our existing product range of harnessed cables suitable for the manufacturers Beckhoff, Festo and Heidenhain will be expanded by further ready-to-connect cables.

- ▲ The seven qualities always give you the most cost-effective cable that is certain to work in your application
- ▼ Reduce storage space: delivery in 5 business days, to your required length, no minimum order quantity, no cutting charges
- 100% tested (test seal of approval and test report)
- Individual service life calculation, exactly what you need
- 🔗 Get the right drive cable in just two steps, online: [igus.eu/readycable](https://igus.eu/readycable)





**New**

## EPLAN macros up-to-date

Update to the EDS24 standard

For many years, the macros have allowed readycable® product data to be imported into EPLAN and thus speed up designing by up to 50%. We have now adapted 1,500 EPLAN macros to the new EPLAN Data Standard 24 (EDS24).

- ▲ Quality of readycable® product data for EPLAN at top level
- ▼ 50% faster electrical design
- EPLAN Data Standard 24 specifications fulfilled
- Efficient processes and precise dimensioning thanks to reliable data
- 🔗 Seamless integration into digital electrical design



**New**

## Ready for the future

CAT8 connectors for the data transmission of tomorrow

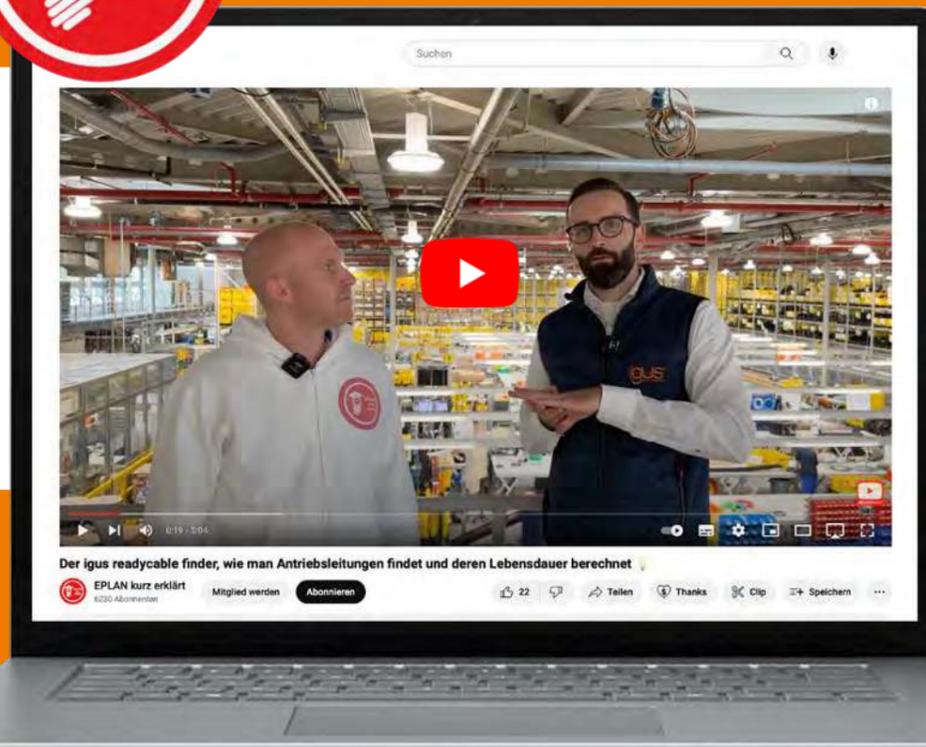
RJ45 connector acc. to CAT8 standard, for the future of industrial data transmission in the field of network technology. Available from stock.

- ▲ Highest data transmission rates for industrial requirements
- ▼ Planning security, no retrofitting in the future
- 100% test (digital I/O test, data transfer rate, etc.)
- Future-proof data communication
- 🔗 All igus® connectors online: [igus.eu/connectors](https://igus.eu/connectors)



## Understanding EPLAN made easy

EPLAN P8 tutorials for beginners and advanced users



On his YouTube channel, Kai Hennings explains the basics of EPLAN P8 in short tutorials. New videos for beginners and advanced students are published at least once a week.

[igus.eu/eplan](https://igus.eu/eplan)



**New**

## More options for Single Pair Ethernet

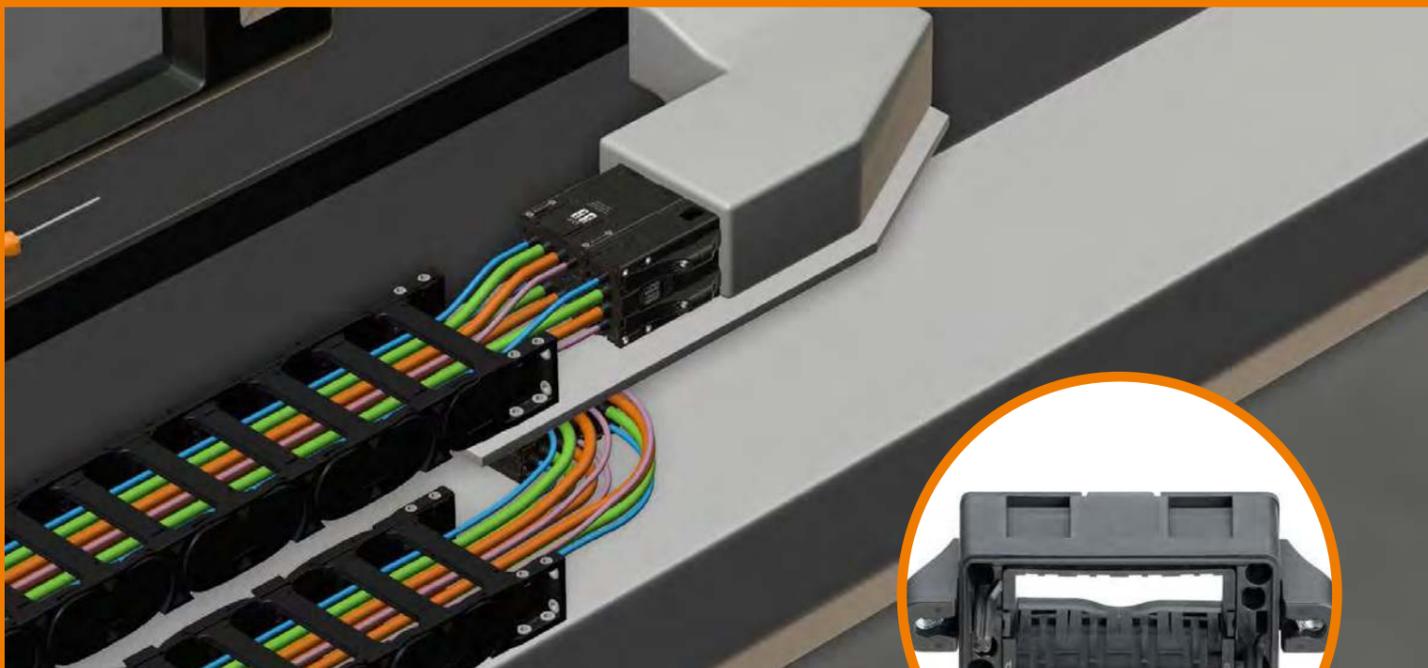
New connector for SPE readycable® cables

Single Pair Ethernet enables continuous Industrial Ethernet communication with just one core pair, ideal for small installation spaces. With the new M12 connector from Harting, we are now expanding the possibilities of igus® assemblies for this technology.

- ▲ Highest data transmission with only one core pair
- ▼ Ideal for small installation spaces
- 100% tested (test seal of approval and test report)
- Future-proof data communication
- 🔗 Calculate the guaranteed service life of the cable online



# Easy to attach



New #assembly

## One connector instead of many

### Attachment housing for Module Connect

One plug-in connector module instead of many individual connectors - that's the idea behind Module Connect. The new add-on housing now further expands the options for utilising the benefits directly on the control cabinet or terminal box.

- ▲ Easily expand the application possibilities of the Module Connect system
- ▼ Reduce set-up time to a minimum
- In use in numerous applications
- Fibre-reinforced, high-performance polymer. Weight saving compared to conventional rectangular connectors
- 👉 Order Module Connect sets in the online shop with one click: [igus.eu/connectors/module-connect](https://igus.eu/connectors/module-connect)



### Module Connect in use at Zemat Technology Group

## Higher efficiency, lower costs

The Zemat Technology Group from Poland is a manufacturer of corrugated cardboard packaging machines. The Boxmat machine series is designed for the production of corrugated cardboard packaging in small and medium runs. It carries out processes such as cutting, folding cardboard, applying glue and printing in a single cycle. One design challenge was to connect the various modules of the machine via energy and data cables as well as pneumatic hoses. The designers opted for ready-to-

connect readychain® cable assemblies, consisting of cables of the chainflex® range (including CF130.07.42.UL and CFBUS.PVC.045) with Module Connect.



**Daniel Marzec**  
Head of e-chain systems®  
igus® Poland

According to the Zemat Technology Group, the plug-in connector concept is more compact than conventional plug-in connectors with retaining clips. The solution also reduces downtimes and increases production efficiency – while reducing costs at the same time.

Application video:



# GO ZERO lubrication



**800,000 hours for lubrication maintenance in hydraulic excavators. Why?**

**Go zero lubrication! With AI!**

igus®



GO ZERO Lubrication ... save lubrication time and costs

# Bicycle components



Tech up



Cost down



Proof



Sustainability



Digital

## 108

**Framework of possibilities**  
Bike frame made of solid plastic

## 110

**Durable, sustainable, individual**  
Solid plastic wheels

## 112

**Corrosion-free, robust, recyclable**  
Tribo-optimised plastic handle bar

## 114

**The lubrication-free wheel for zero maintenance**  
Freewheel made of solid plastic

## 116

**Heavy-duty, maintenance-free**  
Plastic bicycle pedal crank

### More igus® for bikes



**Just-in-time production on site**  
Short transport paths thanks to local supply chains



**Low CO<sub>2</sub> footprint**  
Energy-saving production and easy to recycle



**Zero maintenance**  
Lubrication-free and corrosion-free



### igidur® in the rear frame

High rigidity, 80g weight saving, longer service life and zero maintenance.



### Bike magazine

All about igus® expertise and plastic components for the bicycle industry. Tech up, save weight and maintenance. MAT0075295.20

[igus.eu/news-bike-components](https://igus.eu/news-bike-components)

Bike frame made of solid plastic

# Framework of possibilities



New

## Robust, lightweight, recyclable

Bike frame made of solid plastic

Whether a minimalist look or eye-catching colours, the injection moulding process enables creative designs and individual customisation options. Different composites available.

- ▲ Vibration-damping and corrosion-free
- ▼ No weld seams thanks to injection moulding process
- Tested in the new igus® bicycle laboratory
- Energy-saving injection moulding processes and short transport paths (local supply chains)



Interview on igus® expertise for bicycles

## Access to a completely new technology

### Which products from igus® can be used in bicycles?

igus® bearings can be used both as standard catalogue parts and in special geometries in many bicycle components. Our plain bearings are most commonly found in dropper posts, pedals, damper eyelet bearings and rear derailleurs, but also in suspension forks, brake levers and rear wheel swing arms.

### What advantages do igus® plain bearings offer compared to metal bearings?

The biggest advantage is obvious: corrosion is no longer an issue. In addition, igus® bearings are significantly lighter, more cost-effective and lubrication-free. Another factor is the significantly thicker wear layer compared to PTFE-lined bearings with steel backing. The extremely low total moisture absorption of the plain bearings is also worth mentioning. Once our bearings have been installed, you can use the high-pressure cleaner again: no lubricant can be rinsed out and nothing can rust.

### Why does igus® now also offer structural components for the bicycle industry and what are they currently?

We offer the bicycle industry access to a completely new technology: bicycle components made from high-performance plastics. By using plastics, developers can completely rethink design and geometry. Our components are made from 100% recyclable composites, which have a significantly smaller CO<sub>2</sub> footprint than aluminium thanks to energy-saving production. Our product portfolio currently includes frames, handlebars, cranks, wheels and forks. The use of recycled materials is already possible in some cases. In addition to catalogue products, we also address OEM manufacturers who want to innovatively implement their own ideas and designs with us.

### Why should customers choose igus® solutions instead of conventional components?

igus® offers real innovations for bicycle manufacturers. Completely new design possibilities are conceivable that cannot be realised with aluminium.



Jan Philipp Hollmann  
Head of Business Unit - Bicycle Components

In addition, we can combine different plastics to provide rigidity or flexibility with pinpoint accuracy. This ensures both riding comfort and optimum power transmission. Compared to aluminium, plastic frames have no unsightly weld seams. Thanks to our modular concepts, mould costs are reduced and efficiency is increased. Customers get everything

from a single source at igus®. Be it the development of the desired components, FEM analyses, in-house material development, prototype construction, in-house toolmaking or a complete test laboratory for all relevant components. And high volume production also takes place at igus®.

### Are there special challenges in the bicycle industry that igus® components solve better?

Our solutions stand out from competitors' products on several levels. Firstly, we produce locally at our production sites in Germany, the USA, Asia and other igus® locations. The delivery routes are short, transport by sea is eliminated and both time and CO<sub>2</sub> emissions are spared. Thanks to just-in-time production, we are able to deliver quickly and customers' storage capacities can be reduced. Business becomes more predictable and profitable thanks to production to order. In addition, our plastic components can be 100% recycled at the end of their life cycle.



New

## For perfect surface quality

### Modular injection moulded bicycle frames

The modular OEM frame for city and trekking bikes weighing less than 4kg. Several frame sizes and designs from one tool set. Simple design changes, quick response options for interface adaptations and fast implementation.

- ▲ Optimised stiffness to weight (STW)
- ▼ Economies of scale in toolmaking
- Ongoing tests in the igus® bicycle testlab
- Energy-saving injection moulding processes and short transport paths (local supply chains)



New

## Weight down, performance up

### Modular performance bike frame

Modular OEM performance frame weighing less than 2kg for gravel, MTB and racing bikes. Different frame sizes, lightweight construction.

- ▲ Lightweight construction for maximum performance
- ▼ Economies of scale in toolmaking
- Ongoing tests in the igus® bicycle testlab
- 100% recyclable



New

## Futuristic look, robust and sustainable

### Rotomoulded bicycle frame

The basis of the igus:bike. Futuristic frame from sustainable production, as mainly recycled plastic waste is used here. Shaping the mobility of tomorrow from marine plastic.

- ▲ New rotomoulding technology
- ▼ Low tooling costs
- Tested in the new igus® bicycle laboratory
- Shaping the mobility of tomorrow from marine plastic



New

## Durable, sustainable, individual

### Solid plastic wheels

Exceptionally durable and maintenance-free thanks to the reduced design with just a few strong spokes. The usual hassle of bent or broken spokes is a thing of the past.

- ▲ High strength
- ▼ Reduces maintenance and lubrication costs
- Tested in the new igus® bicycle laboratory
- Energy-saving injection moulding process and short transport paths (local supply chains)



New

## Strong, easy to recycle

### Rotomoulded wheels

Futuristic wheels with strong spoke design, especially suitable for high loads. They are manufactured using the energy-saving rotomoulding process.

- ▲ New rotomoulding technology
- ▼ Low tooling costs
- Tested in the new igus® bicycle laboratory
- Energy-saving rotomoulding process and short transport paths (local supply chains)



Tribo-optimised plastic handle bar

# Steering towards the future



New

## Corrosion-free, robust, recyclable

Tribo-optimised plastic handle bar

Bicycle handlebars made from high-performance plastic. Weather-resistant, insensitive to cold and heat, and therefore in top condition even after many rides - corrosion is not an issue here. Extremely robust, yet light and comfortable. The material is vibration-damping and effectively absorbs vibrations. We manufacture the handlebars individually in a variety of colours and shapes as required; pedal cranks and handlebars can be produced in the same colour.

- ▲ Various design options, different colours
- ▼ Reduces maintenance costs
- Tested in the new igus® bicycle laboratory
- Energy-saving injection moulding processes and short transport paths (local supply chains)



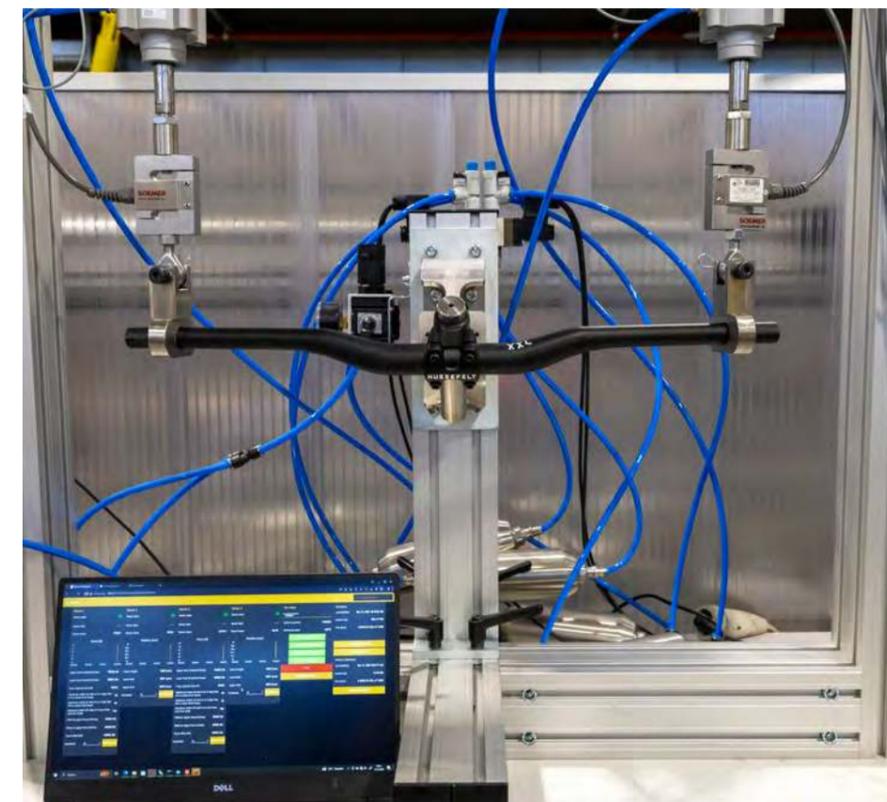
## The unique igus® bicycle test laboratory Tested and safe

igus® naturally carries out its own tests - what has always applied to energy chains, plain bearings and the like is no different for bicycle components.

The test stations built especially for the new bicycle products run around the clock to ensure the resilience and safety of the plastic components.

Bicycle frames, wheels, handlebars, cranks, etc., are stressed, pulled, pressed and twisted, sprayed with water and dirt, exposed to cold and heat in order to fulfil every standard and ensure a long service life.

But we go one step further - because we test with higher requirements than the standard demands. And to be on the safe side, we have our components tested by well-known, specialised bicycle test laboratories. To prove externally that our components deliver what we promise.



The handlebars are loaded and unloaded several hundred thousand times in the test rig.



The injection moulded components are examined using an X-ray machine to rule out any defects.



On this test rig, the wheels roll over edges and are additionally loaded from above.

Freewheel made of solid plastic

# The lubrication-freeewheel



New

## For zero maintenance

Freewheel made of solid plastic

This freewheel is an innovation: extremely stable and fully manoeuvrable at the same time. As we also rely on integrated solid lubricants for the freewheel, the maintenance effort is greatly reduced compared to a conventional bike.

- ▲ Resistant to dirt
- ▼ Maintenance-free operation
- Tested in the new igus® bicycle laboratory
- Lubrication-free without oil and grease



New

## Heavy-duty, maintenance-free

Plastic bicycle pedal crank

The stress placed on the pedal crank in a bicycle's drive is enormous, which is why this component has been designed to withstand very heavy loads. It is also lightweight and corrosion-free. Our plastic pedal cranks are available in various designs and colours, and pedal cranks and handlebars can be supplied in the same colour.

- ▲ Unique tribo-optimised pedal connection
- ▼ Reduces maintenance costs
- Tested in the new igus® bicycle laboratory
- Lubrication-free without oil and grease



New

## Minimum wear, maximum freedom from maintenance

Belt tensioner with xiros® ball bearing

Combination of iglidur® A160 tension roller with xiros® ball bearing. Minimal belt wear with max. freedom from maintenance.

- ▲ Long service life due to minimal wear
- ▼ Zero maintenance effort (saves time and money)
- xiros® and iglidur® tested in numerous test programs in the igus® laboratory
- 100% lubrication-free operation without oils, greases, etc.



# Further highlights

igus® components for bicycles



**Pulleys**  
Wear-resistant plastic gears



**Planetary crank gearbox**  
Reliable and maintenance-free



**Bicycle wheel bearings**  
100% lubrication-free



**Plain bearings for bicycles**  
Lubrication and maintenance-free



**Sample box**  
Our products for bicycles in a box



Order your free sample box with these product samples and further information about our motion plastics® for the bicycle industry.



## An idea becomes reality - igus:bike becomes RCYL

While on holiday on the beach in Florida, the idea for a rust-free and easy-care plastic bicycle took roots in igus® CEO Frank Blase's mind and he couldn't let go of it.

A bicycle with the beautiful working title igus:bike rose up in his mind, but three pieces of the puzzle were still missing to complete the project: frame, wheels and the fork. They were found ten years later - with the Dutch start-up mtrl.

The go-ahead was given for the igus:bike project, it was tinkered with, tried out, discarded, rethought and developed ... three years passed before the first prototype of the urban bike was ready. Finally, the igus:bike was presented to the world at the Hannover Messe, and even German Chancellor Olaf Scholz marvelled at the plastic bicycle. Development

was intensified, new prototypes were assembled, tested and improved. Bicycle components were innovatively rethought in plastic and realised in a way that no one had done before.

Until the time finally arrived at the beginning of 2024 - a small batch of the first 100 igus:bikes went into production! The prototype status is gradually being abandoned and the focus is increasingly shifting towards high volume production. That's why the working title igus:bike is now being discarded and the RCYL brand is seeing the light of day! Once high volume production starts and the bike goes on sale, there will only be the RCYL logo on the frame - and the igus:bike will be history. But a story that will continue. Because if you do discover an igus:bike on the road, we will test the latest components. And many of them are in progress!

**RCYL** is more than just a plastic bike, it's a way of life! It is the motivation to change something. To break up existing thoughts and constructs and to rethink them. To be innovative, to be different.

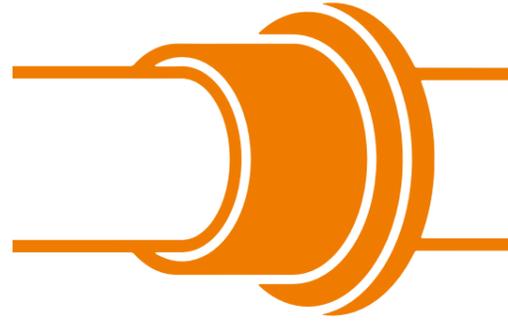


RCYL combines sustainable action with modern mobility in the city. With bicycle components made from recycled plastic. For the environment. For a future worth living. For more fun when cycling.



GO ZERO lubrication ... save lubrication time and costs

# iglidur® plain bearings



Tech up



Cost down



Proof



Sustainability



Digital

## 120

Universal and PTFE-free  
iglidur® JPF

## 122

Without PTFE with FDA  
iglidur® IC-05PF

## 125

Heavy-duty cost-effective ...  
iglidur® Q2LW

## 128

For large diameters  
iglidur® "large bearings"

## 130

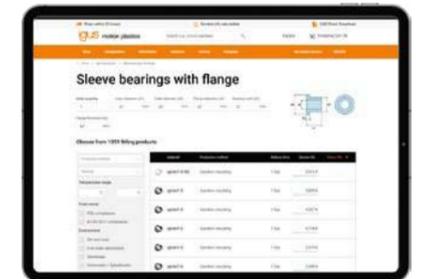
Flexible processing all round  
iglutex® TXH

## Blog topics

#heavyduty, page 18  
motion plastics® for heavy-duty applications

#food, page 21  
motion plastics® for the food industry

#PTFE, page 22  
motion plastics® for PTFE-free applications



## Online tool

iglidur® expert  
igus.eu/ibh



## Carriage in port crane systems

With iglutex® TX1 plain bearings, igus® enables maintenance- and lubrication-free bearing support of the bogie axes in the undercarriages of port cranes.



## Catalogue

Find out everything you need to know about iglidur® bearing technology. Take a look at application examples and additional information. MAT0075651.20

# igus.eu/news-iglidur

# Universal and PTFE-free



**New** #PTFE

## The proven endurance runner without PTFE

iglidur® JPF

Based on the tried and tested iglidur® J endurance material, iglidur® JPF has comparable specifications - without the use of PTFE.

- ▲ Wear-resistant and versatile without PTFE
- ▼ Cost-effective with injection moulding
- Equal or better tribological specifications compared to iglidur® J, depending on the application
- Enables 100% lubrication-free operation



# Conductive and PTFE-free



**New** #PTFE

## For antistatic requirements, without PTFE

iglidur® FPF

The new material iglidur® FPF is not only conductive and therefore ideal for applications with ESD requirements, but also PTFE-free.

- ▲ Conductive and PTFE-free
- ▼ Reduces maintenance and lubrication costs
- Equal or better tribological specifications compared to iglidur® F, depending on the application
- Environmentally friendly, no additional lubricants needed



# Without PTFE with FDA



Update #food

## The all-rounder with FDA

iglidur® IC-05PF for food applications

According to FDA, EU 10/2011 and now new: without PTFE. With excellent sliding and wear properties.

- ▲ Wear-resistant, all-round material with good sliding properties
- ▼ Easy powder coating of electrically conductive components
- Tested according to FDA and good resistance in the salt spray test according to DIN EN ISO 9227
- Environmentally friendly, no additional lubricants needed
- 🔗 Online price and delivery time calculation: [igus.eu/icd](https://igus.eu/icd)



# Now with GB 4806.1/.7



Update #food

## For the specialist Chinese food industry

iglidur® AX500 for food applications

According to FDA, EU 10/2011 and new: GB 4806.1/7. The high-temperature material with ESD specifications can now also be used for applications that require compliance with Chinese food standards.

- ▲ Wear-resistant, electrically conductive high-temperature material
- ▼ More cost-effective than comparable solutions made of stainless steel and durable
- Tested according to the specifications of the National Health and Family-Planning Commission
- Lubrication eliminated entirely. No washing out of grease in the cleaning process
- 🔗 Price, delivery time and service life calculation at a glance: [igus.eu/ibh](https://igus.eu/ibh)



Calculate the CO<sub>2</sub> footprint for each component

# CO<sub>2</sub> - full transparency



## Update

### Now for all iglidur® plain bearings

Calculate the CO<sub>2</sub> footprint for each component

The CO<sub>2</sub> emissions generated during the transport and manufacturing processes of our plain bearings can now be calculated and displayed for each iglidur® bearing.

- ▲ Reduces the CO<sub>2</sub> footprint of your bearing points
- ▼ Saves costs due to reduced CO<sub>2</sub> emissions
- Calculated and documented in accordance with TFS and GHG Protocol specifications
- Optimise sustainability with reduced CO<sub>2</sub> emissions
- 🔗 Available online for all products in the igus® online shop: [igus.eu/ibh](https://igus.eu/ibh)



igidur® Q2LW

# Heavy-duty cost-effective



## New #heavyduty

### Made from cost-effective regranulate for high loads

igidur® Q2LW

The regranulate version of the tried-and-tested iglidur® Q2 heavy-duty plain bearing material is ideal for price-sensitive applications with high loads.

- ▲ For high load capacity and good abrasion resistance
- ▼ Cost-effective
- Tribological specifications comparable with iglidur® Q2
- Use of already processed materials and lubrication-free



iglidur® ECON materials

# Low-cost materials



## Update

### When things need to be particularly cost-effective

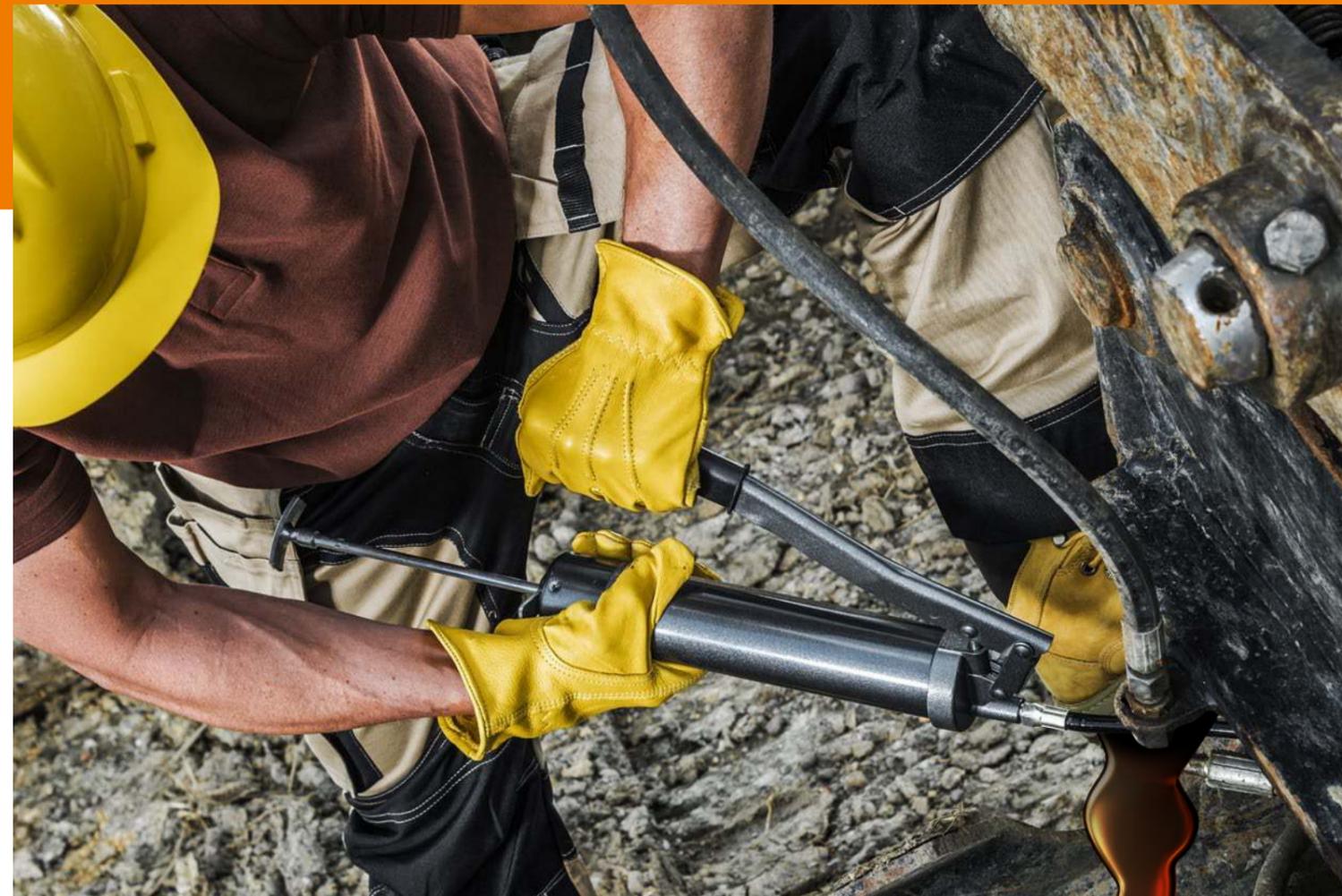
iglidur® ECON materials

The materials of the ECON series, iglidur® J4, GLW, P4, PLW210, ALW350, HLW and NEW: Q2LW are not only ideal for a wide range of applications, but are now also available on the European market in standard dimensions.

- ▲ Universally applicable; versions for high temperatures, for use in combination with food and with wear-resistant specifications available
- ▼ Cost-effective, especially for larger quantities
- Tested in our own rigs for indoor and outdoor use
- Approx. 50% reduced CO<sub>2</sub> footprint
- 🔗 Price, delivery time and service life calculation at a glance: [igus.eu/ibh](https://igus.eu/ibh)



# #lubrication-free



## Save 800,000 hours of maintenance time

Lubrication-free excavation made easy! In Germany, hydraulic excavators require 800,000 hours of maintenance over their service life to relubricate the bearings. (Manufacturing Technology Institute MTI and Machine Tool Laboratory WZL of RWTH Aachen University, "Ecological assessment of the use of plastic bearings", Aachen 2023)

[igus.eu/lubrication-free](https://igus.eu/lubrication-free)



# For large diameters



## Study

### Almost unlimited diameters possible

#### iglidur® "large bearings"

With the new bearing segments made of iglidur® J, plain bearings with large diameters can be realised quickly and easily with postforming processes.

- ▲ Large diameters can also be combined with the specifications of iglidur® bearings
- ▼ Cost-effective
- Based on the established endurance material iglidur® J
- Lubrication-free dry operation means that no lubrication is released into the environment



## From development

### Plain bearing segments for particularly large diameters

Particularly large plain bearings are required where particularly large components are mounted for movement.

Lars Butenschön, Head of the iglidur® Plain Bearing Business Unit, explains: "This is about rudder bearings for ships, for example, whose diameter can easily be half a metre or more. Large plain bearings can also be found in wind turbines. Door-sized control and adjustment flaps for hydroelectric power stations and similar plants have to be mounted, and radio telescopes and radar antennas would hardly be of any use if they were not mounted in a rotatable and swivelling manner."

The particularly large diameters of several hundred millimetres pose a challenge for plain-bearing manufacturers. One reason that iglidur® materials are so successful is their flexibility. However, there are limits to this flexibility when it comes to the maximum dimensions that can be realised. The thermoplastic compounds are usually processed by injection moulding or extrusion, which limits large diameters to a certain extent.

So what to do? The obvious approach: manufacture the plain bearings in segments, which can then be assembled to form a complete bearing. Niklas Pietrula, Product Developer in charge of the project, reports: "We were initially able to produce the segments simply from extruded plate material. As thermoplastics can be heated and reshaped several times, we use adjustable dies to shape the segments into the required form while applying heat."

While iglidur® materials are fundamentally versatile and optimised for a wide range of purposes and applications, it



Niklas Pietrula, plain bearing development, with large bearing

became clear relatively quickly that the material of choice for this project was the universally applicable iglidur® J. "Many of our customers rely on our plain bearings made from iglidur® J as they are highly wear-resistant and ideal for many applications in the low to medium temperature range," explains Butenschön. "However, the choice was ultimately also influenced by the fact that iglidur® J can be moulded very well under heat and is also available as plate material. Other materials are also already being tested."

The finished moulded segments are finally provided with counterbores and then screwed into a sheet metal ring. Other types of installation are also possible. "The thickness of the plates used and the good wear properties ensure sufficient security so that the screw connection does not cause any difficulties later on in the application," explains Pietrula. "Other assembly options such as gluing or solutions based

on positive fit can also be realised. In this project, we benefit from the expertise we have gained with our large slewing ring bearings."

igus® slewing ring bearings are also based on individual sliding segments and therefore offer a lubrication-free and uncomplicated alternative to rolling bearings. With the JRS-500-Z universal sliding element, which is also made of iglidur® J, slewing ring bearings with diameters of 500 to 2,000mm can be manufactured without any gradations. igus® was able to transfer the development results of this product series to the development of the new sliding plate segments for large sliding bushes.

"Experience shows that when it comes to bearing supports in larger diameters, we are often talking about customised products for customer projects. Off-the-shelf solutions rarely work due to the different use cases and customer requirements. In this respect, the study is an example of a potential solution. At the end, we customise everything according to the customers' wishes," says Butenschön.



Lars Butenschön  
Head of Business Unit  
iglidur® Plain Bearings

# Flexible processing all round



Study #heavyduty

## Heavy-duty composite bearing with homogeneous design

igutex® TXH

The new fibre composite material for high loads has a homogeneous layer structure and can therefore be flexibly processed and used on all sides.

- ▲ Homogeneous design and resilient
- ▼ No lubrication and maintenance
- Resilient and easy to process
- Environmentally friendly, no additional lubricants needed



Plus #heavyduty

## Wear-resistant

iglidur® TX1 and TX3 - further dimensions

- ▲ Low wear rates in dry operation under extreme conditions
- ▼ No lubrication and maintenance
- Tested in the igus® plain bearing test laboratory at up to 100MPa and pivoting of 0.01m/s
- Long service life due to low wear; no additional lubrication required
- 🔗 Price, delivery time and service life calculation at a glance: [igus.eu/ibh](https://igus.eu/ibh)



Plus #heavyduty

## Extremely robust

iglidur® Q3E - further dimensions

- ▲ Suitable for use under extreme loads
- ▼ Cost-effective with injection moulding
- 3x longer service life than igutex® TX1 at a load of 76MPa
- Maintenance-free dry operation eliminates the need for lubricants
- 🔗 Price, delivery time and service life calculation at a glance: [igus.eu/ibh](https://igus.eu/ibh)



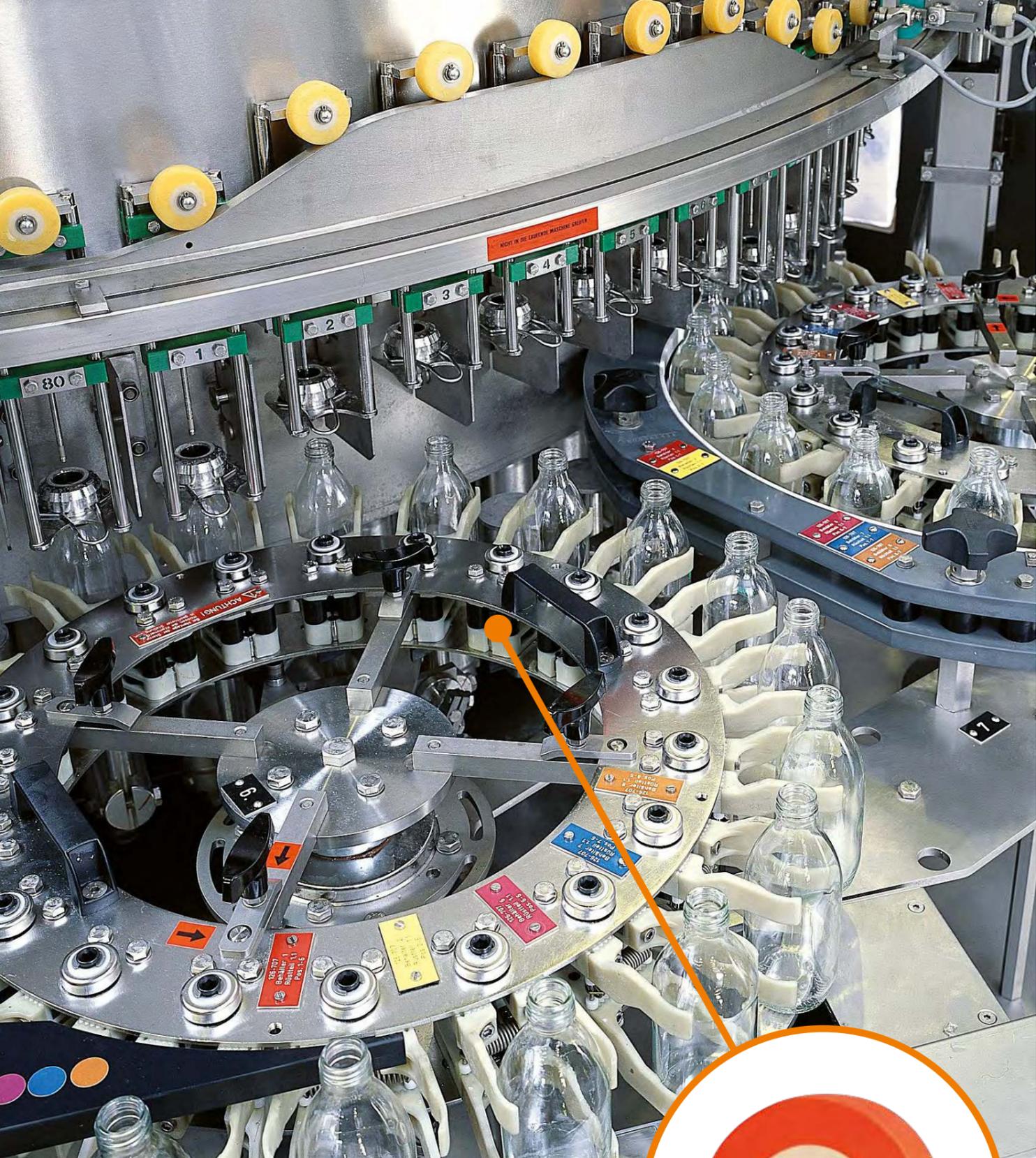
Plus

## 100% dirt-repellent

iglidur® SG-03 - now available with a diameter of 70mm

- ▲ Reliable protection from dirt and dust ingress
- ▼ Reduces downtime and unplanned maintenance
- No dirt ingress after 24 hours in the test rig
- Allows 100% lubrication-free operation





GO ZERO lubrication ... save lubrication time and costs

# iglidur<sup>®</sup> rollers



Tech up



Cost down



Proof



Sustainability



Digital

## 134

**High running performance**  
Skate wheel made of iglidur<sup>®</sup> J

## 135

**The all-rounder**  
Ball bearing roller adapter made of iglidur<sup>®</sup> P360

## 135

**The high performer**  
Ball bearing roller adapter made of iglidur<sup>®</sup> A500

### Blog topics

#food, page 21  
motion plastics<sup>®</sup> for the food industry



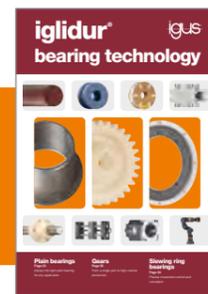
### Sample box

iglidur<sup>®</sup> rollers sample box  
[igus.eu/rollers-sample-box](http://igus.eu/rollers-sample-box)



### Rollers in clamping star wheels

Newly developed two-component rollers in filling machines prove themselves under continuous operation.



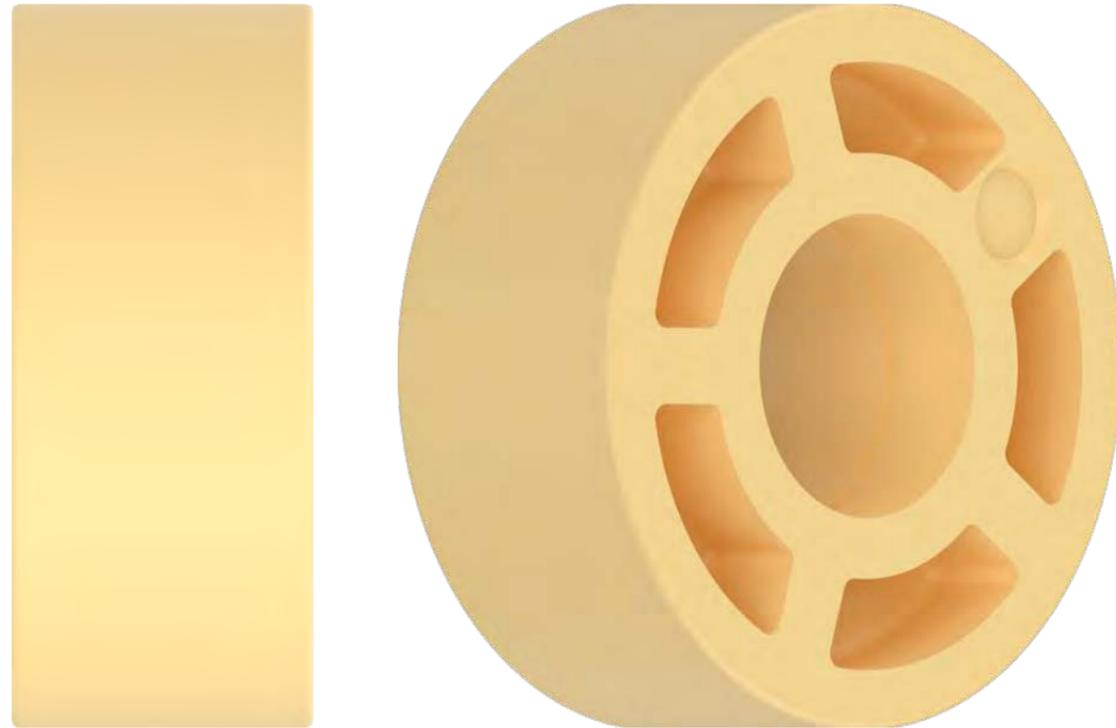
### Catalogue

Find out everything you need to know about iglidur<sup>®</sup> bearing technology. Take a look at application examples and additional information. MAT0075651.20

# [igus.eu/news-rollers](http://igus.eu/news-rollers)

Skate wheels made of iglidur® J

# High running performance



New

## The alternative to classic ball bearings

Skate wheels made of iglidur® J

Durable, cost-efficient and ideal for higher loads: the new skate wheels are the lubrication-free endurance runner when it comes to surface pressures of up to 10MPa.

- ▲ 1:1 substitute for ball bearings of the same size
- ▼ 6 times longer service life compared to standard skate wheels
- In use in numerous applications
- igus® has been an investor in Mura Technology from the very beginning, and is advancing chemical recycling. From plastic waste to crude oil in 20 minutes: [igus.eu/hydroprs](https://igus.eu/hydroprs)



New

## The all-rounder

Ball bearing roller adapter made of iglidur® P360

This ball bearing roller adapter is not only cost-efficient, but stands out due to its low-wear operation. It is also free from lubrication and maintenance.

- ▲ Quiet and wear-resistant
- ▼ Cost-effective, durable material; therefore longer maintenance intervals
- More than 3 times the service life of PA roller adapter
- 100% dispense with any kind of lubrication



New #food

## The high performer

Ball bearing roller adapter made of iglidur® A500

Highly resilient with long running performance: this ball bearing roller adapter allows for reliable operation at temperatures from -100 to +150°C and in combination with chemicals.

- ▲ FDA- and EU10/2011-compliant for chemicals and food
- ▼ Additional reduction in unplanned downtimes
- Successfully tested in the igus® laboratory up to 3,000N radial load
- 100% lubrication-free, clean and hygienic



# JETZT EIN EIS!



SEC° MA  
IC One



ICH BIN EIN EIS

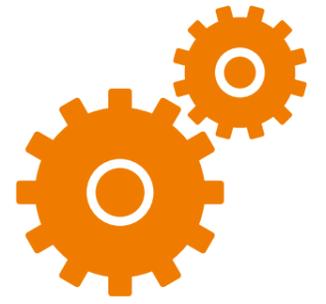


## Gearbox solution in ice cream vending machine

The Apiro® modular gearbox not only ensures long-lasting, low-maintenance operation, but also provides that special "aha moment".

GO ZERO lubrication ... save lubrication time and costs

# drygear® gear and gearbox technology



- Tech up
- Cost down
- Proof
- Sustainability
- Digital

## 138

For the food industry  
iglidur® AD210 gears

## 139

Up to module 8 and ø 500mm  
Large gears machined

## 140

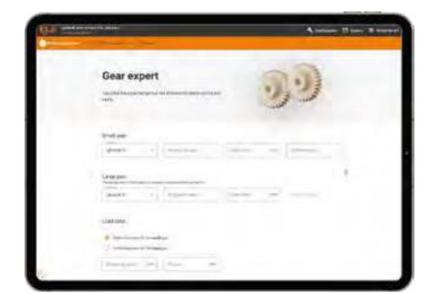
Light, compact and powerful  
drygear® planetary gearbox DG-PLI-56-AD-AST

## 141

Compact 18:1 transmission ratio  
drygear® evoloid gearbox DG-EVO-42-18

## Blog topics

#food, page 21  
motion plastics® for the food industry



## Online tool

Gear expert  
igus.eu/gear-expert



## Catalogue

Find out everything you need to know about iglidur® bearing technology. Take a look at application examples and additional information. MAT0075651.20

# igus.eu/news-drygear

# For the food industry



New #food

## FDA-compliant and magnetic

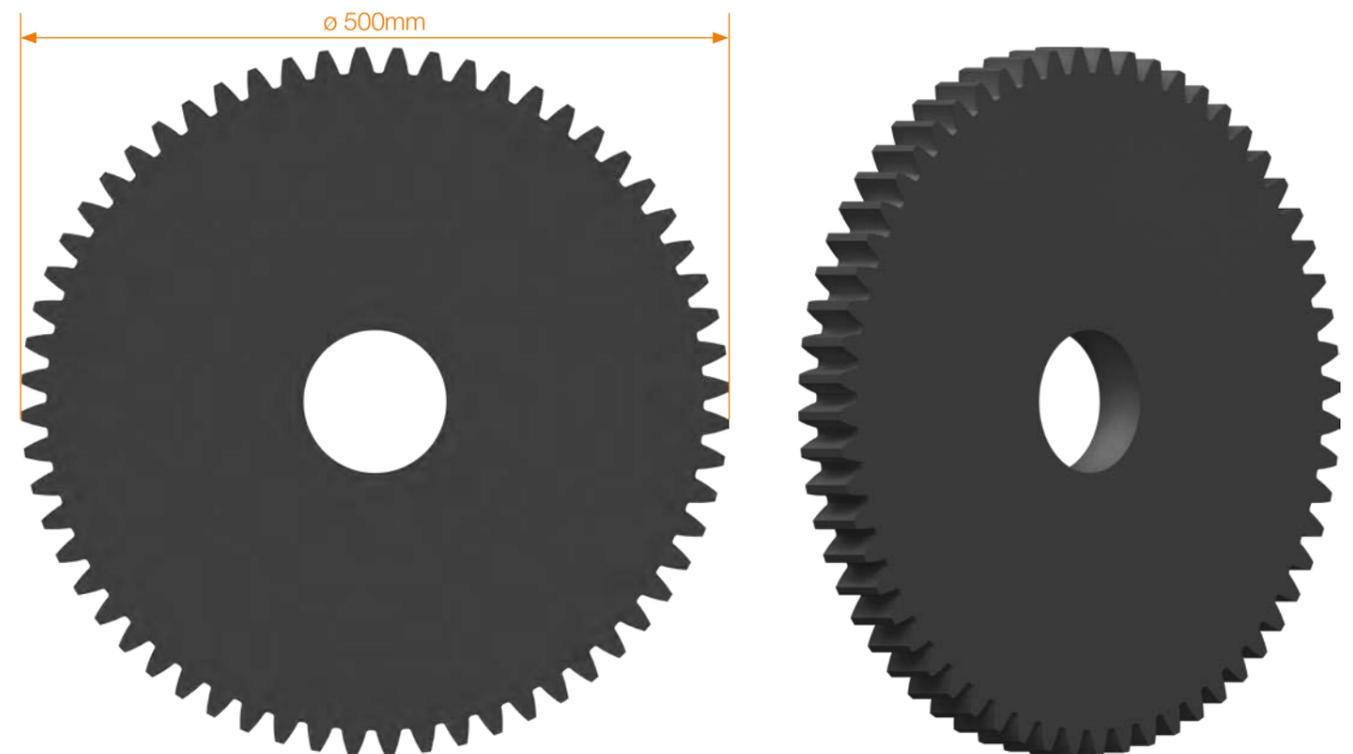
iglidur® AD210 gears

Our gears made from the new material iglidur® AD210 comply with FDA and can be detected visually and magnetically.

- ▲ For the food industry
- ▼ Economic high-volume production through injection moulding
- Compliant with FDA and EU 10/2011
- Environmentally friendly, no additional lubricants needed



# Up to module 8 and ø 500mm



New

## XL gears for large installation spaces

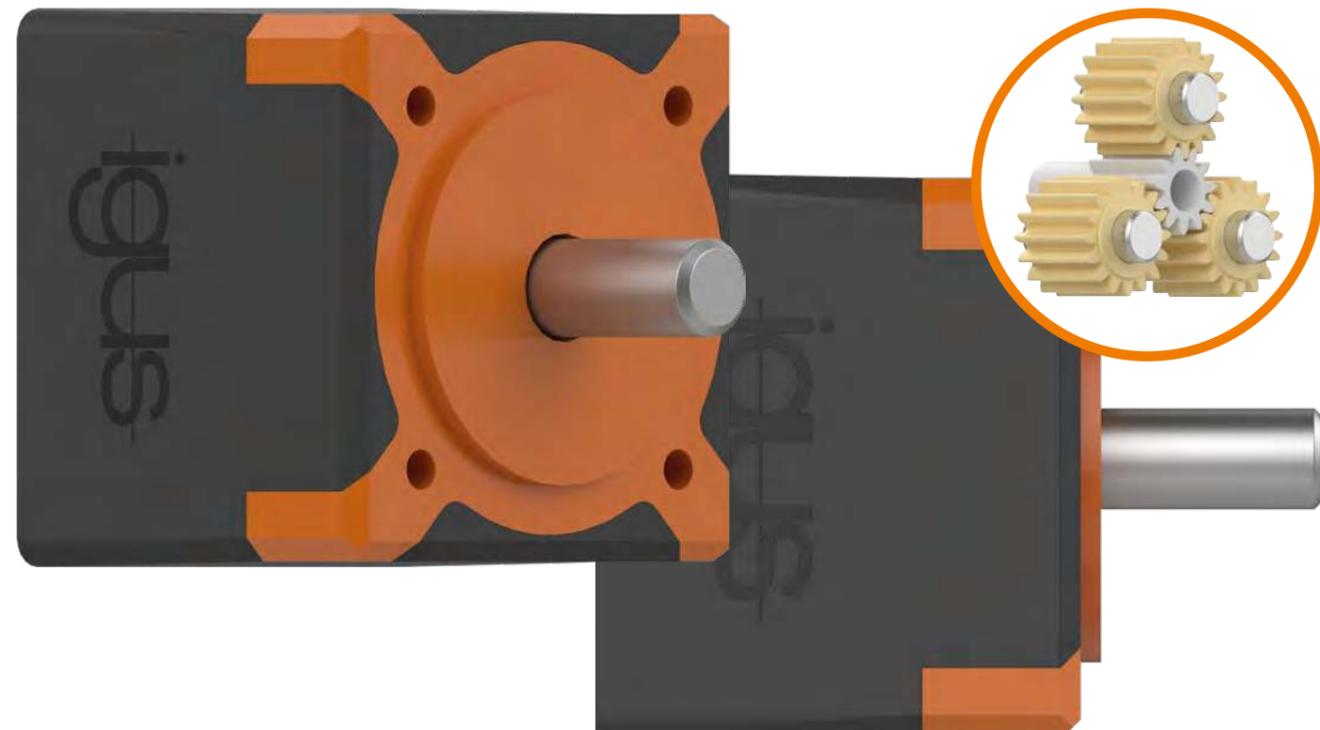
Large gears machined

We now offer large gears made from bar stock with module up to 8 and a diameter of up to 500mm, customised to customer requirements.

- ▲ For large-format applications
- ▼ Economically efficient also with small quantities
- Up to seven times lighter than metallic solutions
- Environmentally friendly as no external lubricants are necessary



# Light, compact and powerful



New

## Transmission ratio 5:1 for stepper motors NEMA 23

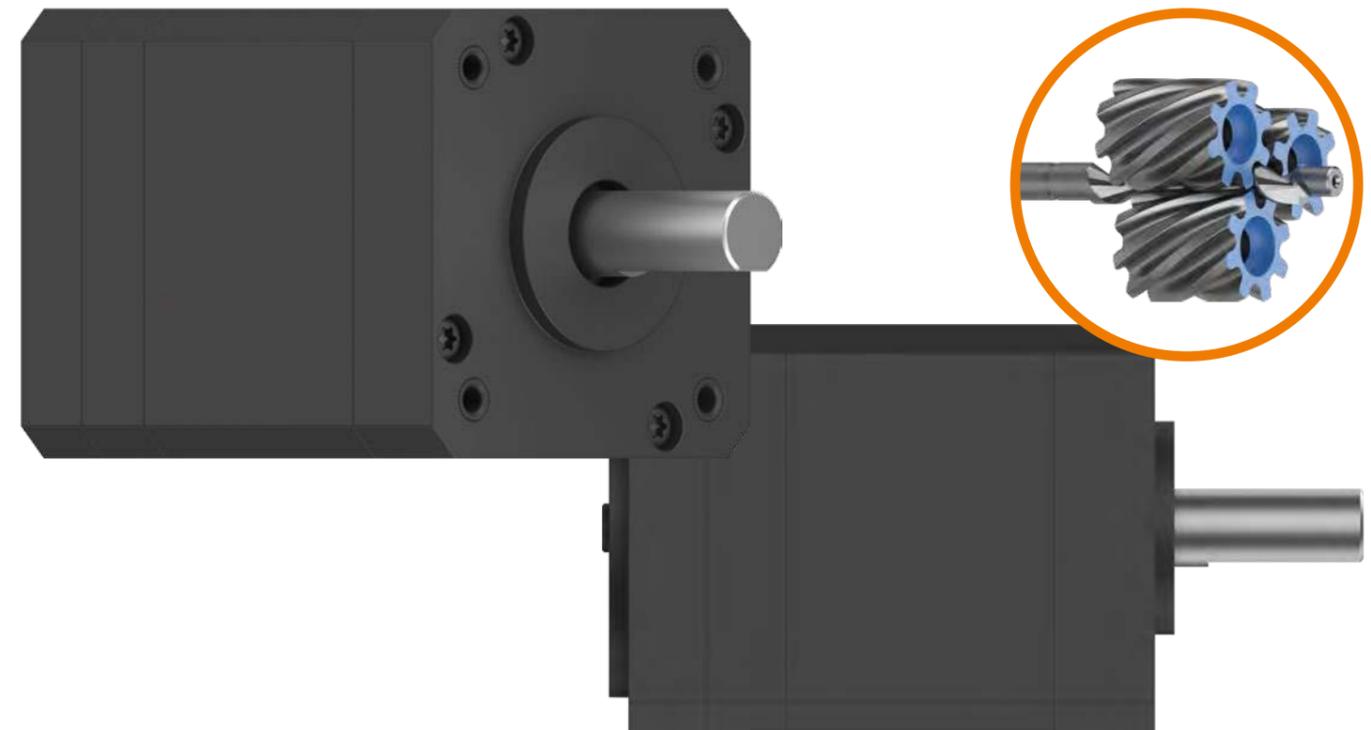
drygear® planetary gearbox DG-PLI-56-AD-AST

From the study to series production: plastic planetary gearboxes for NEMA 23 stepper motors with a transmission ratio of 5:1 are now available. The gearboxes can be purchased individually or with igus® stepper motors already installed.

- ▲ Weight is only 30% of metal gearboxes of the same installation size
- ▼ 50% lower product price with no minimum order quantity due to high injection-moulding content
- Load capacity of up to 6Nm with a service life of 1 million working cycles successfully tested in the drygear® test laboratory
- Environmentally friendly use in dry operation without lubricants and lower power consumption possible due to smaller motor



# Compact 18:1 transmission ratio



New

## Evoloid gearbox - powerful thanks to optimised tooth profile

drygear® evoloid gearbox DG-EVO-42-18

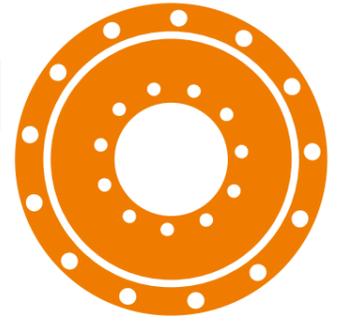
Evoloid gears can be used for designing extremely compact and powerful gearboxes, especially as they use a special sun shaft with just one helical tooth. The ready-to-use coaxial drygear® evoloid gearbox for connection to NEMA 17 motors achieves the high single-stage transmission ratio of 18:1 across three planets for high torque in compact installation spaces thanks to optimised gearing.

- ▲ Compact type with high power density enables up to 60% higher transmission ratio in one stage compared to other planetary gearboxes
- ▼ 70% lower product price with no minimum order quantity due to high injection-moulding content
- Load capacity of up to 6Nm and, at 3Nm, a service life of up to one million work cycles successfully tested in the drygear® test laboratory
- Smaller motor allows for environmentally friendly use in dry operation without lubricants and lower power consumption



GO ZERO lubrication ... save lubrication time and costs

# iglidur® slewing ring bearings



Tech up



Cost down



Proof



Sustainability



Digital

## 144

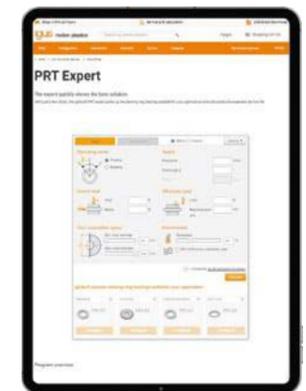
**Lightweight, slim, cost-effective**  
iglidur® PRT-06-100

## 146

**Sustainable performance**  
iglidur® PRT-02-30-WPC

## 147

**Precise adjustment under high load**  
iglidur® PRT-04-XX-ART-F



**Online tool**

iglidur® PRT expert  
[igus.eu/PRT-expert](https://igus.eu/PRT-expert)



**Catalogue**

Find out everything you need to know about iglidur® bearing technology. Take a look at application examples and additional information. MAT0075651.20



**Innovative functionality**

The built-in slewing ring bearing allows the TV holder to rotate freely and smoothly without noise.



[igus.eu/news-prt](https://igus.eu/news-prt)

# Lightweight, slim and cost-effective



## Study

### PRT slewing ring bearings made of aluminium or stainless steel

iglidur® PRT-06-100

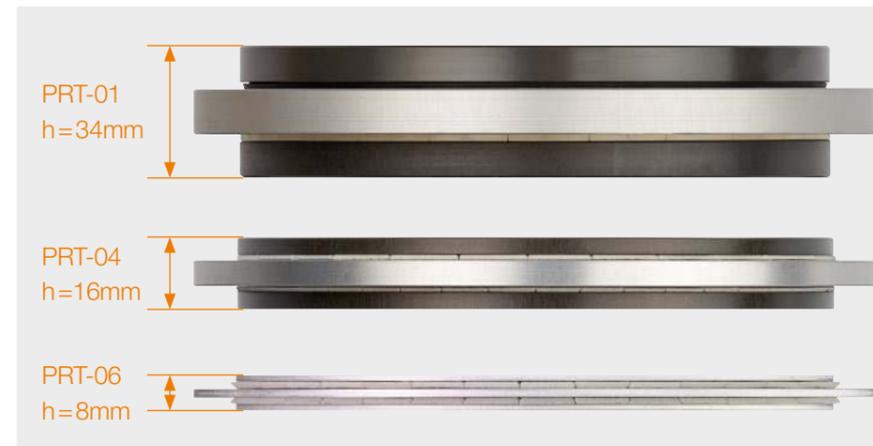
Product study for particularly cost-sensitive bearing solutions made of iglidur® J sliding elements and aluminium or stainless-steel sheets.

- ▲ Wide range of products and durable material combinations
- ▼ The new PRT-06 series is lightweight and affordable
- Up to 85% more cost-effective and at 8mm only half the height of the PRT-04
- Environmentally friendly use in dry operation, 100% lubrication-free



Study: An interview with our developer Jonas Kemp

## The versatility behind the new PRT slewing ring bearing



With a height of only 8mm, particularly slim compared to the -01 and -04 series.

In this interview, our developer Jonas Kemp sheds light on the development and motivations behind the new PRT slewing ring bearing. He focusses on the technical advantages of our new PRT-06 series. Jonas will also explain why this particular bearing solution could be relevant for different industries. The aim is to provide an expert insight into the technological aspects of our new development so as to illustrate potential areas of application and efficiency gains for engineers and developers.

### What is the advantage of a PRT made of aluminium or stainless steel?

The new PRT slewing ring bearing is particularly light, flat and – compared to our other PRT series – more cost-effective. Lightweight and space-saving: at just 8mm, the new PRT is only half the height of the slewing ring bearing from the PRT-04 series. The thin design saves a lot of material compared to other PRTs, which helps significantly reduce the overall weight of the slewing ring bearing. This is particularly important in applications where weight and space play a role, e.g. in the aerospace industry or in the construction of lightweight furniture structures.

The design is also up to 85% more cost-effective than the PRT-04 series. Overall, a PRT slewing ring bearing made

of aluminium or stainless-steel plate enables efficient and reliable performance in various applications. It is important to consider the specific requirements of your application to ensure that the slewing ring bearing and the respective material combination deliver the best results.

### For which applications is the new slewing ring bearing suitable?

The slewing ring bearing is suitable for various industries and applications due to its specific specifications, such as its design and the associated lightweight. The manufacturing process means that the bearings are particularly cost-effective for large sizes.

### Here are nine examples and possible application areas:

- 1. Automotive industry**  
Use in rotary mechanisms for tray tables, seat adjustments and swivel arms.
- 2. Aviation and aerospace**  
Use in bogies, antenna systems, flap mechanisms and other rotating parts due to its lightweight and slim design.
- 3. Robotics**  
Integration in joints and rotation mechanisms of robots for low-friction movements.

**4. Mechanical engineering**  
Applications in conveyor belts, turntables, revolving platforms and other rotating systems.

**5. Medical technology**  
Use in medical equipment such as X-ray machines, CT scanners and patient tables due to its easy movement.

**6. Packaging industry**  
Use in packaging machines, labellers and conveyor systems to enable low-friction rotary movements.

**7. Consumer electronics**  
Use in turntables for cameras, television holders and other electronic devices.

**8. Furniture industry**  
Integration in rotary mechanisms of furniture items such as swivel chairs, swivelling table tops or extendable elements to ensure low-friction and durable functionality.

**9. Camping equipment**  
Use in folding tables, chairs or camping kitchens to provide lightweight, compact yet robust rotary mechanisms.



**Jonas Kemp**  
Development engineer iglidur® PRT

# Sustainable performance



New

## Wood-based slewing ring bearing

iglidur® PRT-02-30-WPC

Wood combination consisting of 50% wood and 50% plastic for a lower CO<sub>2</sub> footprint.

- ▲ Unique product range and sustainable combination of materials
- ▼ PRT-02 series is characterised by light weight and low cost
- Tested in the igus® laboratory for load and wear
- Consists of 50% renewable raw material; CO<sub>2</sub> equivalent: 0.0577kg



# Precision for high loads



New

## Variable locking mechanism

iglidur® PRT-04-XX-ART-F

PRT-04 with locking every 90 degrees as standard: easy to customise with variable distances.

- ▲ Precise slewing ring bearing adjustment, even under heavy load
- ▼ Part of the PRT-04 series's modular system
- Compact yet robust design, tested for load and wear in the igus® laboratory
- Environmentally friendly use in dry operation, 100% lubrication-free





GO ZERO lubrication ... save lubrication time and costs

# iglidur® bar stock



Tech up



Cost down



Proof



Sustainability



Digital

## 150

**PTFE-free in continuous operation**  
iglidur® JPF round bars

## 151

**High wear resistance**  
iglidur® S200 round bars

## 151

**High temperatures**  
xirodur® G220 round bars

## 152

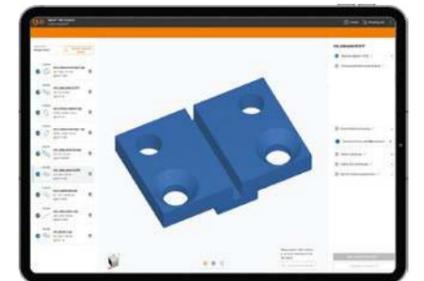
**Wear-resistant endurance runner**  
xirodur® B180 round bars

## 153

**Electrostatically dissipative**  
iglidur® F160 tribo-tape

## Blog topics

**#PTFE, page 22**  
motion plastics® for PTFE-free applications



## CNC special parts

**Online services**  
[igus.eu/cnc](https://igus.eu/cnc)



## iglidur® special parts

The grippers machined from iglidur® J bar stock have proven their worth in practice.



## Catalogue

Find out everything you need to know about iglidur® services. Take a look at application examples and additional information. MAT0075652.20

# [igus.eu/news-barstock](https://igus.eu/news-barstock)

# PTFE-free in continuous operation



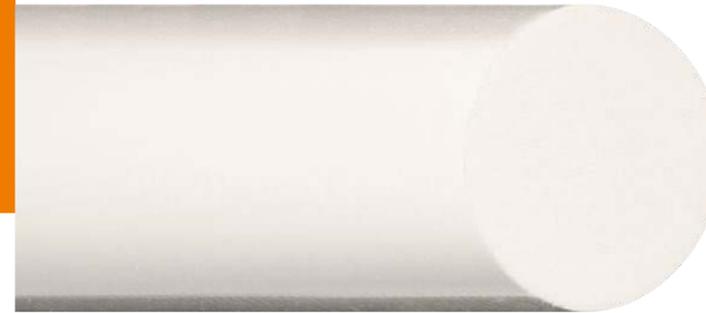
**New** #PTFE

## The proven endurance runner without PTFE

**iglidur® JPF round bars**

Components made from the iglidur® JPF round bars show very good resistance to chemicals and wear, low moisture absorption and are also PTFE-free.

- ▲ High wear resistance without PTFE
- ▼ Low-cost material
- The base material iglidur® J has been used successfully for 10 years
- 100% dispense with any kind of lubrication



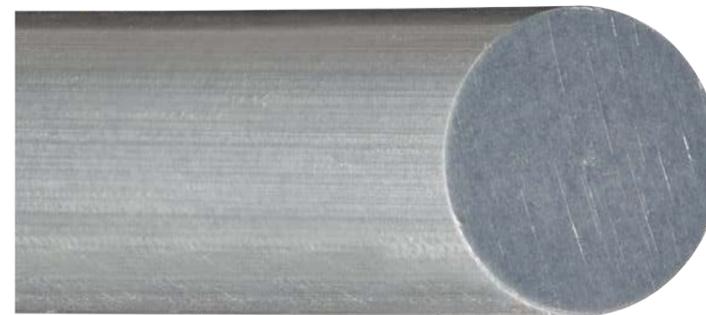
**New**

## High wear resistance

**iglidur® S200 round bars**

Components made from the iglidur® S200 round bars impress with their high wear resistance and low moisture absorption.

- ▲ Longest service life in continuous operation
- ▼ Cost-effective material
- For applications with steel gear rack as mating partner, over 2 times longer service life than standard POM (Test results are based on injection-moulded gears; values for CNC-machined components may vary.)
- Environmentally friendly, no additional lubricants needed



**New**

## High temperatures

**xirodur® G220 round bars**

Components made of xirodur® G220 are cost-effective and suitable for high temperatures.

- ▲ Operation temperature: up to +100°C
- ▼ Low-cost material
- The material has been successfully in use since 2015
- 100% dispense with any kind of lubrication





New

## Long service life

igutek P360 round bars

Components made of igutek P360 impress with their high wear resistance and good tribological specifications. They are also insensitive to impact loads.

- ▲ Suitable for gears subjected to considerable stress
- ▼ Maintenance-free properties reduce costs for lubrication and maintenance
- A proven gear material for over three years
- 100% lubrication-free, clean and hygienic



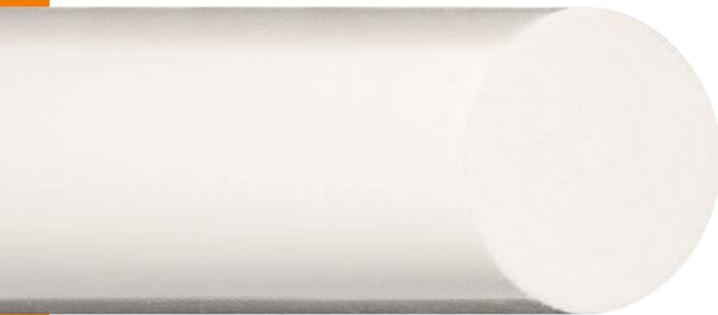
New

## Electrostatically dissipative

igidur® F160 tribo-tape

The electrostatically dissipative tribo-tape is wear-resistant. It is particularly suitable for lining work surfaces in the manufacture of sensitive electronic components.

- ▲ ESD protection
- ▼ Avoid damage to or destruction of components
- 10x longer service life in comparison to technical plastics
- Wear protection prolongs your system's service life



New

## Wear-resistant endurance runner

xirodur® B180 round bars

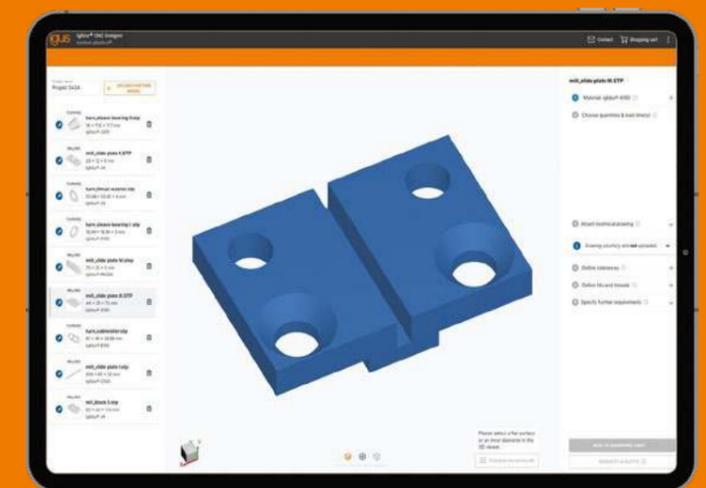
Components made from xirodur® B180 round bars are vibration-dampening and characterised by very low coefficients of friction, which makes them very durable.

- ▲ Increased wear resistance combined with good chemical resistance
- ▼ Long service life
- For applications with plastic gear rack as mating partner, over 1.5 times longer service life than standard POM (Test results are based on injection-moulded gears; values for CNC-machined components may vary.)
- Environmentally friendly, no additional lubricants needed



# Get price, delivery time and service life in no time

Order CNC special parts quickly and easily online - no problem. Supported by helpful functions such as multi-part upload, feasibility analysis, service life calculator, tolerance check and express option, you will receive all the relevant information you need to order your special part in just a few minutes.

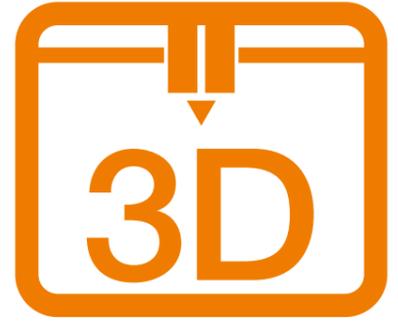


[igus.eu/cnc](https://igus.eu/cnc)



GO ZERO lubrication ... save lubrication time and costs

# iglidur<sup>®</sup> 3D printing



Tech up



Cost down



Proof



Sustainability



Digital

## 156

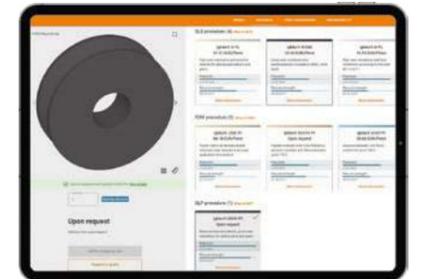
**Wear-resistant and stable up to +110°C**  
iglidur<sup>®</sup> i230 powder for SLS printing

## 158

**ESD components for electronics**  
iglidur<sup>®</sup> i9-ESD powder for SLS printing

### Blog topics

#PTFE, page 22  
motion plastics<sup>®</sup> for  
PTFE-free applications



### Online tool

3D printing service  
[igus.eu/idd](https://igus.eu/idd)



### 3D printed special sliders

More than 200 special sliders made of iglidur<sup>®</sup> i3 ensure smooth sliding in the Darius steering wheel gas ring.



### Catalogue

Find out everything you need to know about iglidur<sup>®</sup> services.  
Take a look at application examples and additional information. MAT0075652.20

# [igus.eu/news-3d-printing](https://igus.eu/news-3d-printing)

iglidur® i230 powder for SLS printing and 3D printing service

# Wear-resistant and stable up to +110°C



New #PTFE

## PTFE-free all-rounder for higher application temperatures

iglidur® i230 powder for SLS printing and 3D printing service

With iglidur® i230, a new all-rounder material was developed for selective laser sintering that is up to 80% more wear-resistant than standard PA12. It has more than 50% higher flexural strength at room temperature compared to iglidur® i3 and is temperature-resistant in applications up to +110°C. Additionally, it is electrostatically dissipative (ESD) and PTFE-free.

▲ Highest flexural strength and temperature resistance: 94MPa at +20°C room temperature

▼ Elimination of need for maintenance saves costs for lubricants and maintenance work

■ Heat resistance tested according to DIN EN ISO 75 in certified external laboratories.  
HDT-A: +167°C / HDT-B: +176°C

● No additional lubrication required due to integrated solid lubricants

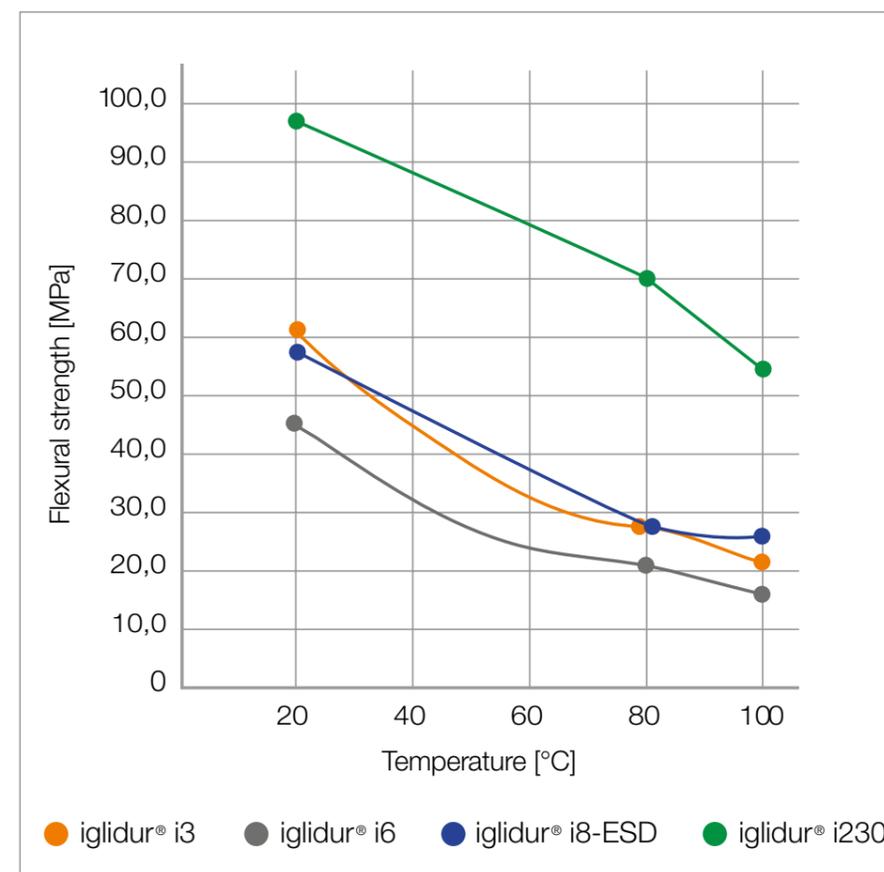
🔗 Available in the online 3D printing service - upload CAD model, compare materials and prices and order: [igus.eu/idd](https://igus.eu/idd)



### The 3-point flexural test

## Flexural strength of the iglidur® laser sintering materials in comparison

The 3-point flexural test is a method for determining the flexural strength and flexural modulus of materials. A specimen with a rectangular cross section is positioned on two parallel supports and loaded in the middle with a test pressing device. The specimen is subjected to a flexural stress, which generates tensile stresses on the top and compressive stresses on the bottom. The resulting sag of the specimen is measured in relation to the applied force. These values can be used to calculate the flexural strength and flexural modulus, which are important parameters for the mechanical behaviour of materials. The flexural test with the iglidur® laser sintering materials shows that the new laser sintering powder iglidur® i230 has the highest mechanical strength, even at higher ambient temperatures. This makes it exceptionally suitable for applications involving wear where components with higher strength are required or for structural components.



Flexural strength depending on temperature (XY orientation)

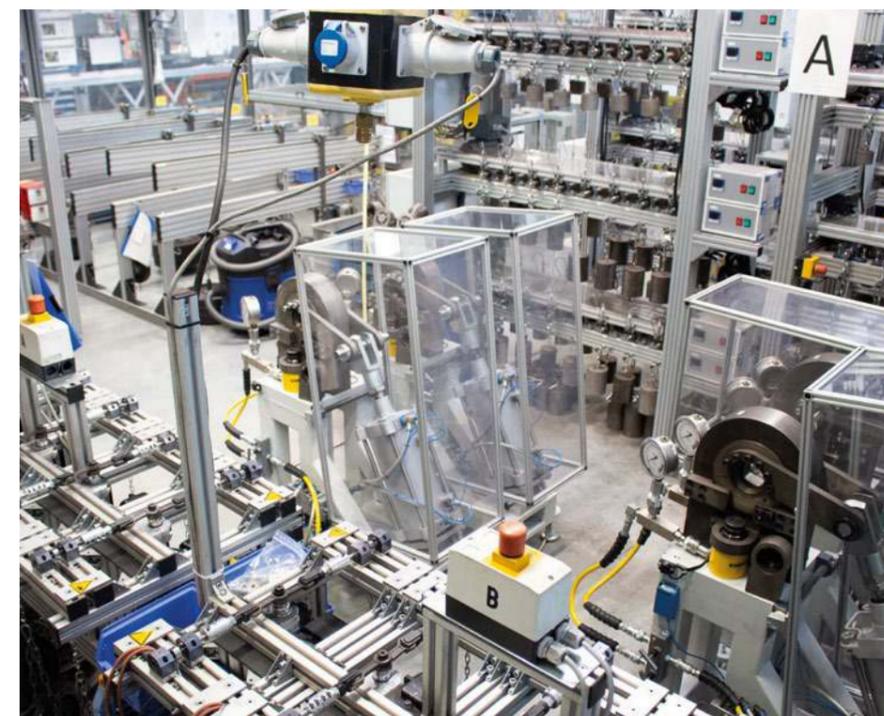
### What is the difference between the all-rounder materials iglidur® i3 and iglidur® i230?

#### iglidur® i3

- Highest wear resistance: abrasion resistance up to 30 times better than PA12
- PFAS-free
- Application temperature up to +80°C
- Flexural strength at +20°C: 62MPa

#### iglidur® i230

- Good wear resistance: abrasion resistance up to 3 times better than PA12
- PTFE-free
- Application temperature up to +110°C
- Flexural strength at +20°C: 94MPa



In the igus® test laboratory on 4,000m<sup>2</sup> floor area, all materials are tested for wear resistance

# ESD components for electronics



**Update**

## ESD protection for sensitive electrical components – get individual components from 5 days

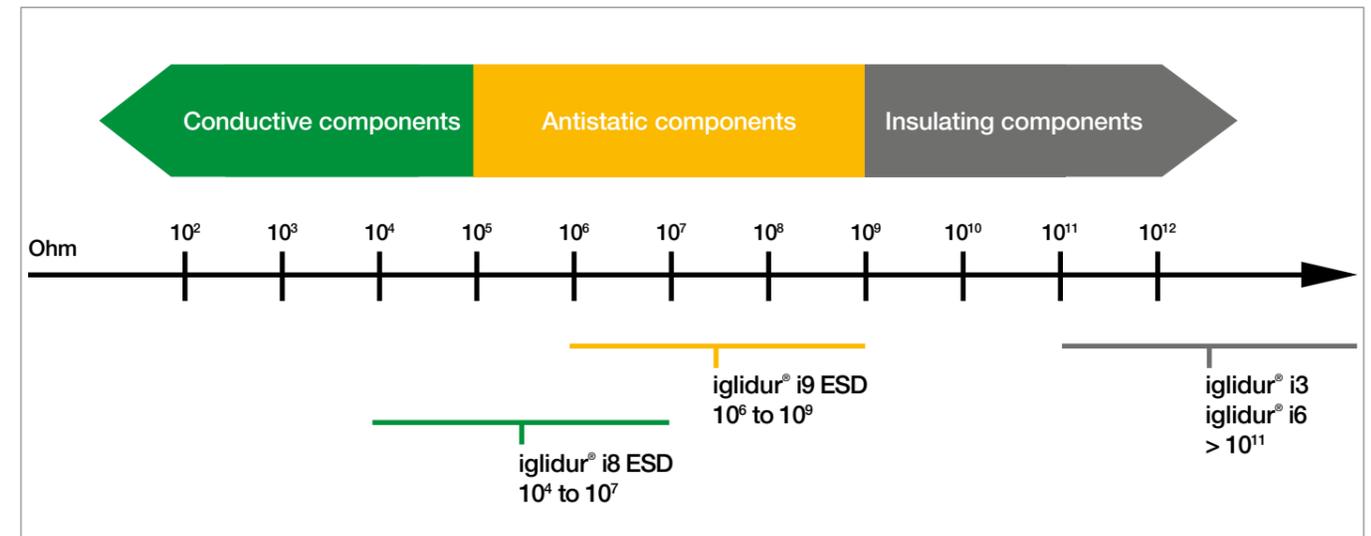
iglidur® i9-ESD powder for SLS printing and 3D printing service

The new SLS powder has an electrical resistance of  $10^6$ - $10^9$  ohms. This makes it electrostatically dissipative and at the same time reduces the risk of unwanted discharge currents between the electrical components. Ideal for applications in the electronics and semiconductor industries and especially for electronic connectors.

- ▲ Maximum service life, ESD protection, no interference currents
- ▼ Avoid damage to components through ESD protection
- Transitional resistance:  $1.0 \times 10^6$  –  $1.0 \times 10^9 \Omega \times \text{cm}$
- No lubrication required due to integrated solid lubricants
- 🔗 Available in the online 3D printing service - upload CAD model, compare materials and prices and order: [igus.eu/idd](https://igus.eu/idd)



## Comparison of conductive SLS materials



**Benefits of iglidur® i8-ESD:**

- Avoid static damage to electrical components, protection in ATEX environments

**Benefits of iglidur® i9-ESD:**

- ESD protection for electronic components, with reduced conductivity to avoid interference currents, e.g. for special connectors

**Benefits of iglidur® i3 and iglidur® i6:**

- Insulating

Online 3D printing service

# Components in 3 days

With our service life calculation, easily find the most cost-effective solution that works

With the igus® 3D printing service, you get your individual component in just a few steps: upload your CAD model and choose a manufacturing procedure and material - that's it.

NEW: Use the service life calculator in the online tool and find the right material even faster.



# igus.eu/idd





GO ZERO lubrication ... save lubrication time and costs

# igubal<sup>®</sup> spherical bearings



Tech up



Cost down



Proof



Sustainability



Digital

## 162

**More fun with the sun**  
ESQM-2.0 pillow block bearing

## 166

**We split it for you**  
Split flange mounted bearings

## 168

**igubal<sup>®</sup> 4.0 sensor**  
The flange mounted bearings new generation

## 170

**Food-compatible**  
Food Contact spherical bearing

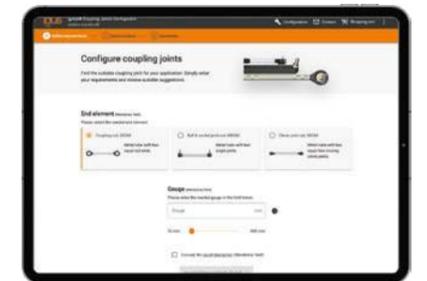
## 172

**High speeds**  
Spherical insert bearings made from iglidur<sup>®</sup> H3

### Blog topics

**#food, page 21**  
motion plastics<sup>®</sup> for the food industry

**#assembly, page 24**  
motion plastics<sup>®</sup> for easy assembly



### Online tool

**Coupling joints configurator**  
[igus.eu/gcc](https://igus.eu/gcc)



### Solar photovoltaics

In real-life tests, our igus<sup>®</sup> materials impress with their particularly high UV resistance.

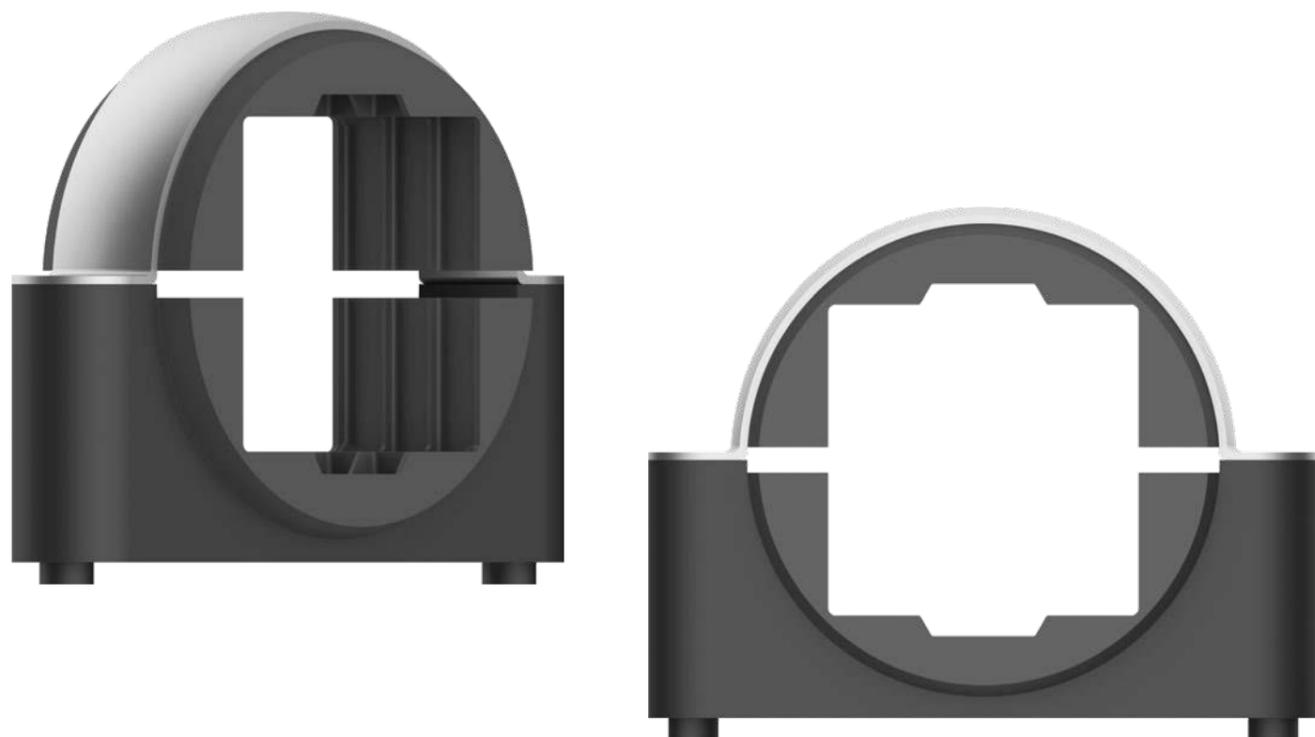


### Catalogue

Find out everything you need to know about igubal<sup>®</sup> spherical bearings. Take a look at application examples and additional information. MAT0075653.20

# [igus.eu/news-igubal](https://igus.eu/news-igubal)

# More fun with the sun



New #assembly

## Absorption of high stationary loads

### ESQM-2.0 pillow block bearing

Our innovative and durable new product for the solar industry. The ESQM-2.0 is an innovative pillow block bearing for tracking solar modules, which is characterised by simple installation, optimised materials, high UV resistance, freedom from lubricants and maintenance as well as a reduced installation height.

- ▲ Angular compensation with spherical bearing (up to 9°)
- ▼ Quick, simple assembly
- Static radial load: at 0° angular compensation = 50kN, at 9° angular compensation = 25kN
- Energy-efficient production because construction is entirely made of injection-moulded plastic parts



## Interview with Julian Lewerenz, Development Engineer igubal® News from the igubal® laboratory

**Interviewer:** What is special about the ESQM and how does it work?

**Julian Lewerenz:** ESQM is an abbreviation for a slim (elegant) pillow block bearing for square profiles in metric units. It is a lubrication-free and maintenance-free solution for tracking solar modules that align themselves with the position of the sun. The ESQM is a split pillow block bearing consisting of a split housing and two spherical ball half-shells for easier installation. A square profile is attached to the housing, which serves as a support for the solar modules. The spherical ball is made from our wear-resistant and chemical-resistant tribopolymer. It enables an angle compensation of up to 9 degrees and a high radial load capacity of up to 50kN.



The ESQM-2.0 (3D-printed version) in the test.



Our ESQM-2.0 pillow block bearing in igus® outdoor test lab

**Interviewer:** How did you come up with the idea of developing ESQM-2.0?

**Julian Lewerenz:** The idea for ESQM-2.0 came from the needs of our customers. From time to time we received questions, for example about optimised installability, more space-saving or more cost-effective solutions. With ESQM-2.0, we want to further optimise our ESQM in order to offer customers the optimum solution for their solar tracker applications.

**Interviewer:** What exactly are the benefits of ESQM-2.0 for customers and the environment?

**Julian Lewerenz:** The new ESQM-2.0 offers many advantages for customers and the environment. By reducing the amount of material, we have been able to save weight compared to the previous model, which has a positive impact on the environment and product costs. We have also changed the orientation of the spherical ball from a V to a U and added pins to the lower housing to prevent the bearing from slipping during assembly, which should make it easier to fit. In addition, openings were made in the spherical ball to guide cables along the profile, which was requested by many customers. The materials used have also been optimised. The materials used for both the spherical ball and the housing are now even more UV-resistant. In terms of resilience and wear resistance, the new ESQM-2.0 is in no way inferior to the original version and delivers the usual reliable results.

**Interviewer:** What are your future plans for the ESQM?

**Julian Lewerenz:** We are constantly working on improving and expanding ESQM. In the future, we also want to offer other profile sizes and housing variants in a modular system to create more flexibility for customers. We also want to combine ESQM with other igus® products, such as our energy chains, highly flexible cables or robotic components, to offer a complete system solution for the solar industry.



**Julian Lewerenz**  
Development Engineer igubal®

## Why ESQM-2.0?



Our igubal® ESQM pillow block bearings in use on a solar tracker field.

With the ESQM-2.0, the focus is primarily on improvements. We want to constantly improve our products. We have already made a good name for ourselves in the solar universe with the regular ESQM. We have been working with many well-known tracker manufacturers for several years, not only in Germany but all over the world.

We are in constant dialogue with our customers. We are very interested in how our customers use our products. We specifically ask for experience directly from the construction site. From the people who deal with it every day. We are also in regular contact with our international subsidiaries, which are also in direct dialogue with our customers.

Although our current ESQM offers many advantages (angle compensation up to 9°, optimum material combination, lubrication-free, 25-year guarantee, etc.), we still see some potential for optimisation, which is normal. We actually see this kind of optimisation in every technical sector.

**We from development and sales got together with the aim of developing a new and improved ESQM version. We focussed on three areas: design, material and costs.**

- **Design for faster installation:** Customers can save valuable time and money.
- **Material for reliability:** The first products for solar applications have been in use for over 15 years. Other products with the same material are also in use all over the world. We therefore have a very good basis in terms of durability. Here, too, we wanted to improve and become even more reliable. Continuous development of new materials thanks to our R&D department allowed us to use new materials.
- **In terms of costs, the focus was on the design:** Material savings without compromising the mechanical load specifications. We also want to realise a kind of modular system, whereby we can replace the upper housing with a metal housing.

To summarise, we have achieved another major milestone. I am sure that our new ESQM-2.0 is a great addition to our existing ESQM family and I am very excited to see what we will realise with it together with our customers.

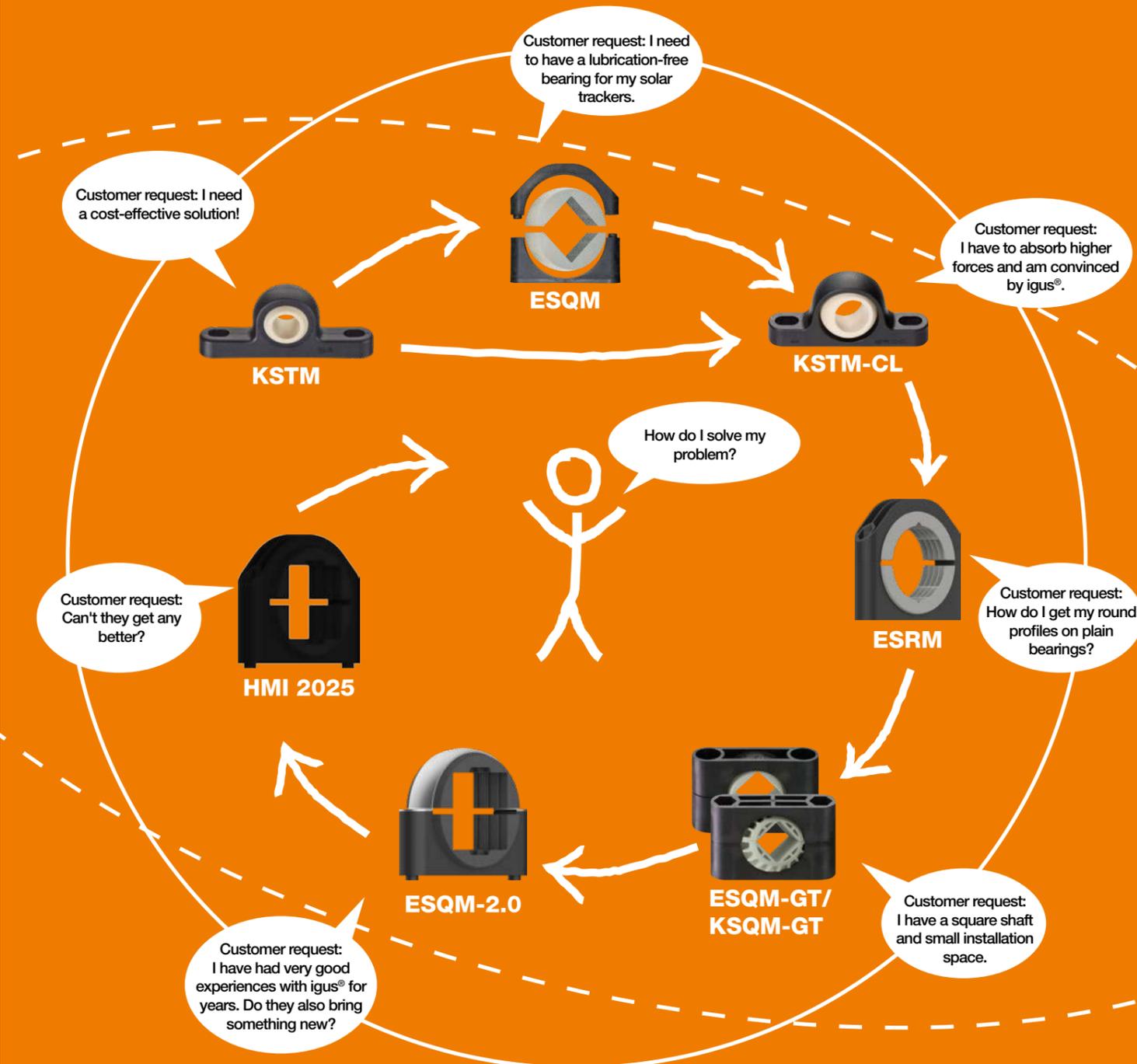
**Have fun with the sun.**



**Richard Won**  
Industry Manager Solar

# Development stages of the igubal® pillow block bearing

Every customer request constantly helps us with our developments



[igus.eu/pillow-block-bearings](https://igus.eu/pillow-block-bearings)



# We split it for you



New #assembly

## Split igubal® bearings in various designs

### Split flange mounted bearings

We now also offer split versions in addition to our existing flanged bearings.

- ▲ Simplified installation even in existing applications
- ▼ Saves time-consuming maintenance
- Up to 14.8kN static load capacity
- No lubricant required



### igubal® split bearings

## Simplified installation even in existing applications

Flange mounted bearings are an important component in mechanical engineering and are used in many different industries. They are used to create a strong connection between machine parts and ensure smooth movement. They are particularly important for increasing the service life of machines and minimising downtime. The requirements for flange mounted bearings vary greatly depending on the application area. In the food industry, for example, they must be hygienic and must not release any lubricants. In paper processing, they have to withstand high loads, while in conveyor technology they have to be robust and durable. As a specialist in high-performance polymers, igus® has managed to combine all these specifications in a plastic bearing. The igubal® spherical insert bearings are true lightweights - a full 80% lighter than metallic solutions.

Despite their lightweight property, they are just as robust. The best thing about it: igubal® spherical insert bearings are up to 40% more cost-effective than conventional bearings and prove to be economical in operation. Thanks to dry operation without lubrication, they are also completely maintenance-free. The igubal® spherical insert bearings are available in various high-performance plastics, each with different specifications.

### Innovative solution in the field of assembly: split bearings from igubal® minimise downtimes

However, igubal® has not only set itself apart from conventional pillow block bearings with the specifications of its products, but also with an innovative solution in the field of assembly. Closed bearings have to be replaced after wear, which requires enormous conversion

work depending on accessibility. With the split solutions from igubal®, this is now a thing of the past. The bearings can be installed and demounted directly on the shaft without removing other machine elements. A real step forward in terms of efficiency and time savings! In addition to the split housing and the split spherical insert bearings, igubal® also offers a split plastic fixing collar for the locating spigot of the shaft. This means that igus® offers a complete set with split variants.

With us as a partner, customers can be sure that they will receive high-quality flange mounted bearings that fulfil the requirements of their area of application and are economical and maintenance-free at the same time. By using igubal® spherical insert bearings, companies can not only save costs, but also increase the efficiency of their machines and minimise downtime.



Static load absorption of up to 14.8kN, even with 3D-printed parts.

The split bearings from igus® offer an innovative solution in the field of assembly and increase the efficiency of machines. The igubal® spherical insert bearings are economical and maintenance-free. The divisibility of the bearings is a major advantage, as they can be installed and demounted directly on the shaft without removing other machine elements. Companies can therefore save time and money while increasing the efficiency of their machines. The igubal® spherical insert bearings are an alternative to conventional bearings and offer numerous advantages.

# Intelligently networked



**New**

## The new generation of igubal® flange mounted bearings

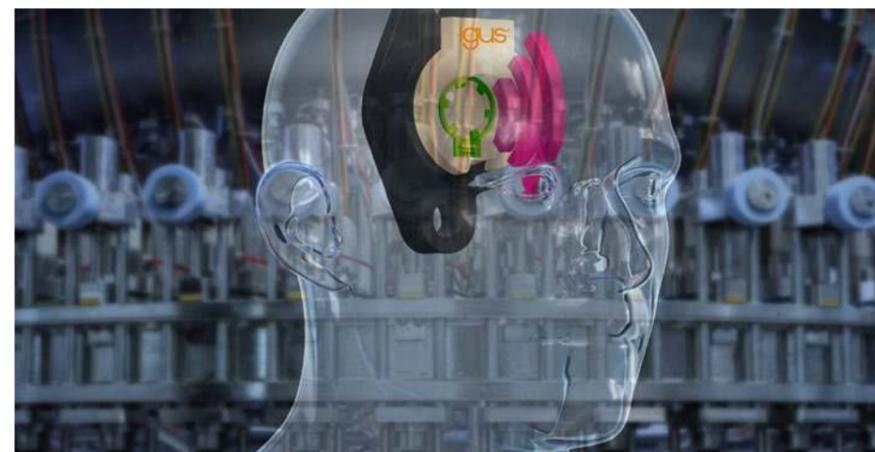
### igubal® 4.0 sensor in spherical insert bearings

igubal® spherical insert bearing with built-in sensor to avoid downtime. Maintenance intervals can be calculated and planned by means of the sensor.

- ▲ Reduce downtime and failures with predictable maintenance intervals
- ▼ Replace the bearings instead of the entire unit
- Developed in response to customer needs. Comprehensive tests are now under way
- With charging socket for rechargeable batteries



## Condition monitoring thanks to smart plastics sensor



According to igus®, expensive machine failures due to undefined defects in highly stressed flanged bearings will soon be a thing of the past. Why? Thanks to a new generation of two- and four-hole flanged bearings. The special feature is that the bearings are made of lubrication-free high-performance plastic and are equipped with miniature wireless sensors. This enables condition monitoring and predictive maintenance.

A technician looks at his smart phone: a flanged bearing in a conveyor belt of the discharge system for beer bottles is approaching the wear limit. While there used to be a risk that the process would go undetected and cause an expensive system failure, the technician now replaces the bearing in good time during the production break. Knowing fully well that the hundreds of other bearings are also communicating with him.

"This scenario is no longer science fiction. As part of our smart plastics range, we are gradually equipping plain bearings made of high-performance plastic with networked sensors," says Thomas Preißner, Head of Business Unit igubal® Spherical Bearings at igus®. "Our two- and four-hole flanged bearings of the igubal® series can now also enable condition monitoring and predictive maintenance to prevent unforeseen damage."

### Flange bearings transmit their status wirelessly

And this is how the new Industry 4.0 bearings work: igus® integrates an abrasion sensor into the polymer spherical ball: a thin circuit board close to the running surface. There is also a battery for the power supply without cables. This means that the bearing for spherical levelling can continue to move independently. Wear interrupts the conductor paths of the circuit board. If the electronics lose the signal of a conductor path, they know that the wear has reached a certain level. The sensor transmits a signal via a long-range network (LoRa), a wireless standard for the Internet of Things that is known for its energy efficiency.

The receiver is the i.Cee® switch cabinet module, which analyses the data. The associated software now knows that the conductor path is worn out, and infers the percentage of abrasion. Over time, the sensor itself wears away layer by layer - parallel to the bearing's running surface. It continues to send out signals that allow conclusions to be drawn regarding the bearing's condition. Users can see the remaining service life and when maintenance is due on a web-based dashboard, which they can access from anywhere in the world with a PC, tablet or smartphone.

### Luxembourg's national railway company is the first pilot customer for smart fixed flange bearings

The new flange mounted bearings are currently in the prototype phase. However, they have already convinced one pilot customer: the Société Nationale des Chemins de Fer Luxembourgeois (CFL). Luxembourg's national railway company operates a 200-metre washing system that cleans local and long-distance trains every day. In the past, gearbox malfunctions on the washing trolley repeatedly led to costly system failures.

The operator therefore abandoned lubricated standard ball bearings and instead used the networked spherical balls from igus® in the UC bearing housings. The advantage is that the spherical balls made of high-performance plastics are corrosion-free, resist chemicals and enable low-friction and maintenance-free dry operation thanks to incorporated solid lubricants. "The other bearings have to be lubricated every few weeks, which is very time-consuming," says CFL Maintenance Manager Mike Feinen.

"We have therefore ticked off this maintenance issue." Says Thomas Preißner: "The new networking feature puts the icing on the cake. Thanks to continuous condition monitoring, CFL can prevent failures, plan maintenance work ideally and make full use of the polymer bearings' service life."



**Thomas Preißner**  
Head of Business Unit igubal®  
Spherical Bearings

# Compliant with food requirements



**Update** #food

## Spherical bearing 1:1 for direct food contact

igubal® for food contact

Now replace your igubal® standard spherical bearings 1:1 with a variant made of food-compliant and detectable materials.

- ▲ FDA and EU10/2011 compliant and detectable
- ▼ Up to eight times more cost-effective than comparable stainless steel solutions
- See for yourself our free igubal® FC sample box: [igus.eu/fc-sample-box](https://igus.eu/fc-sample-box)
- No lubricants necessary

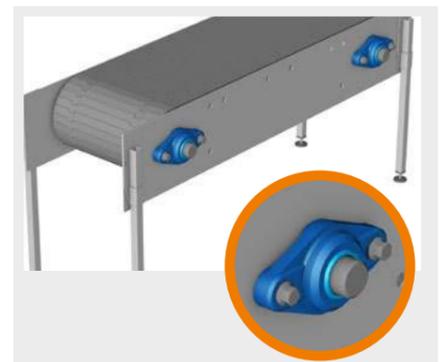


Customer application

## Conversion to food contact possible without any problems



Filling machine for beverage cans



Conveyor belt

As in the case of a large manufacturer of beverage filling systems, who has now ordered a standard flange mounted bearing of the EFOM series as an igubal® Food Contact variant. We had not yet produced the installation size previously used by the customer in the food-compliant material, but were soon able to provide them with samples in the required material. After a successful installation and function test, the changeover at the customer's premises was carried out without any problems and igus® was able to add another part to its catalogue range and now supply it from stock. "If you would also like to convert to our igubal® Food Contact spherical bearings, please contact us. We would also be happy to send you in advance our free igubal® Food Contact sample box!"

"Since 2019, we have been building up a catalogue range with food-safe variants in parallel to our standard range of igubal® spherical bearings, mostly based on the specific needs of our customers," reports Dennis Steffen, Product Manager for igubal® spherical bearing technology at igus®. "Our spherical bearings made from standard materials are used in a wide range of industries and have also been used in the food and beverage industry for a long time because they do not require any lubricants."

Due to ever stricter regulations in food production, plant manufacturers are increasingly reliant on stainless steel solutions and special lubricants, especially when the bearings come into direct contact with the products. Here, igus® now offers a solid plastic solution that is up to eight times more cost-effective. "Although our blue igubal® Food Contact spherical bearings are slightly more expensive than our standard parts, they are still many times

more cost-effective than stainless steel and are also approved and detectable for direct contact with food. They are also maintenance-free thanks to the solid lubricants incorporated in the plastic." Switching from the igubal® standard part to a Food Contact variant is very easy: simply add the suffix "-FC" to the part number and you will be supplied with a part that is identical in size but conforms to food regulations. The most common sizes and variants are already available in our online shop and most of them are available from stock. "We can supply an estimated 90% of our igubal® spherical bearing range as a 1:1 food contact variant, as the required injection moulded parts can be produced in the same tools as the standard parts," says the product manager. "If we do not yet produce a desired variant or size, we will be happy to take your enquiry or order as an opportunity to expand our Food Contact product range accordingly and make the changeover possible for you at short notice."



**Dennis Steffen**  
Product Manager igubal®



**New**

## High speeds

### Spherical insert bearings made from iglidur® H3

The material range of the (maintenance-free) igubal® spherical insert bearings made of plastic was expanded by the material iglidur® H3. This means that conveyor speeds of up to 200rpm can be realised in the future. In addition to the approx. 80% weight reduction compared to metal versions, they are very robust and at the same time capable of dry operation without additional lubrication.

- ▲ Realises conveyor speeds of up to 200rpm
- ▼ Simple installation of maintenance-free spherical insert bearings saves time and money
- Customer references with run times of over a year and load tests in the laboratory
- Avoidance of regular bearing changes



**New**

## New low-cost material for customised coupling joints

### Coupling joints with variable length

Brass tube replaces galvanised steel - a low-cost option for M6 ball studs (WDGM-06) and 10mm shafts (KDGM-10) is now also available.

- ▲ Six different variants of interface connectors with up to five sizes available for customised centre distances
- ▼ Cost-effective, customised coupling joints, even for small and medium quantities (no minimum order quantity)
- WDGM-06-A-MR-SZ-FX, 180mm: maximum tensile load: 396N, maximum compressive force: 1,420N
- Avoids resource consumption by making it easier to use identical parts
- 🌐 Calculate prices online now and download CAD: [igus.eu/gcc](https://igus.eu/gcc)



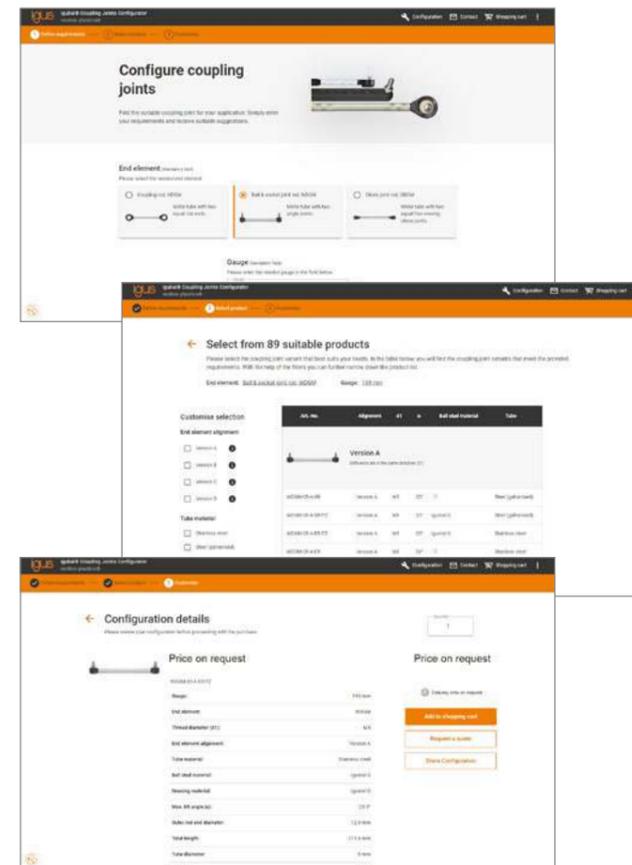
**Plus** #assembly

## Product range addition

### Fixing collars made of polymers - more dimensions

Maintenance-free, corrosion-free fixing collar with stainless steel screw/nut for locking shaft ends. Split design available. Ideal for confined installation spaces.

- ▲ Fixing collar: simple installation; split fixing collar: simple installation possible even in tight installation spaces
- ▼ Cost-effective compared to steel
- Socket cap bolt DIN 912 made of stainless steel
- More energy-efficient production method



**Update**

## Configure double joints easily

### igubal® coupling joints configurator

Find the right coupling joint for your application: just enter your requirements.

- ▲ Individually optimised or suitable standardised components at the touch of a button
- ▼ Reduces unnecessary costs for custom-made products by showing existing alternatives
- See for yourself and test our igubal® coupling joints configurator: [igus.eu/gcc](https://igus.eu/gcc)
- Avoids resource consumption by making it easier to use identical parts
- 🌐 Uses digital services to optimise the procurement process





GO ZERO lubrication ... save lubrication time and costs

# xiros<sup>®</sup> ball bearings



Tech up



Cost down



Proof



Sustainability



Digital

## 176

**For battery production**

PVC conveyor roller with C160 flanged ball bearings

## 178

**30 times more service life**

Ball transfer unit with longer service life

## 179

**100% corrosion-free**

Polymer ball transfer units with glass balls

## 180

**The UCFL alternative**

UCFL flanged ball bearing, 2-hole design

## 181

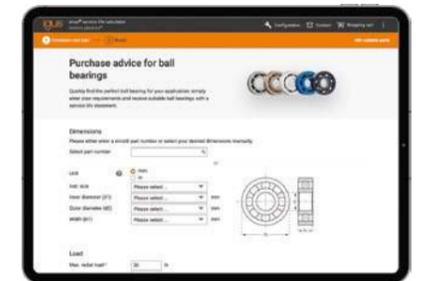
**Weighs up to 80% less**

Pillow block ball bearing, narrow design

## Blog topics

**#packaging, page 20**

motion plastics<sup>®</sup> for hygiene-sensitive areas



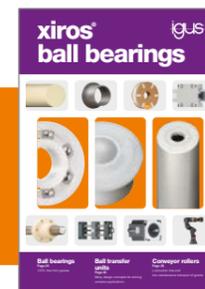
## Online tool

**Purchase advice for ball bearings**  
[igus.eu/XLR](https://igus.eu/XLR)



## Up to 40% fuel savings

The plastic ball bearing made of xirodur<sup>®</sup> B180 is used due to its high corrosion resistance and lightweight.



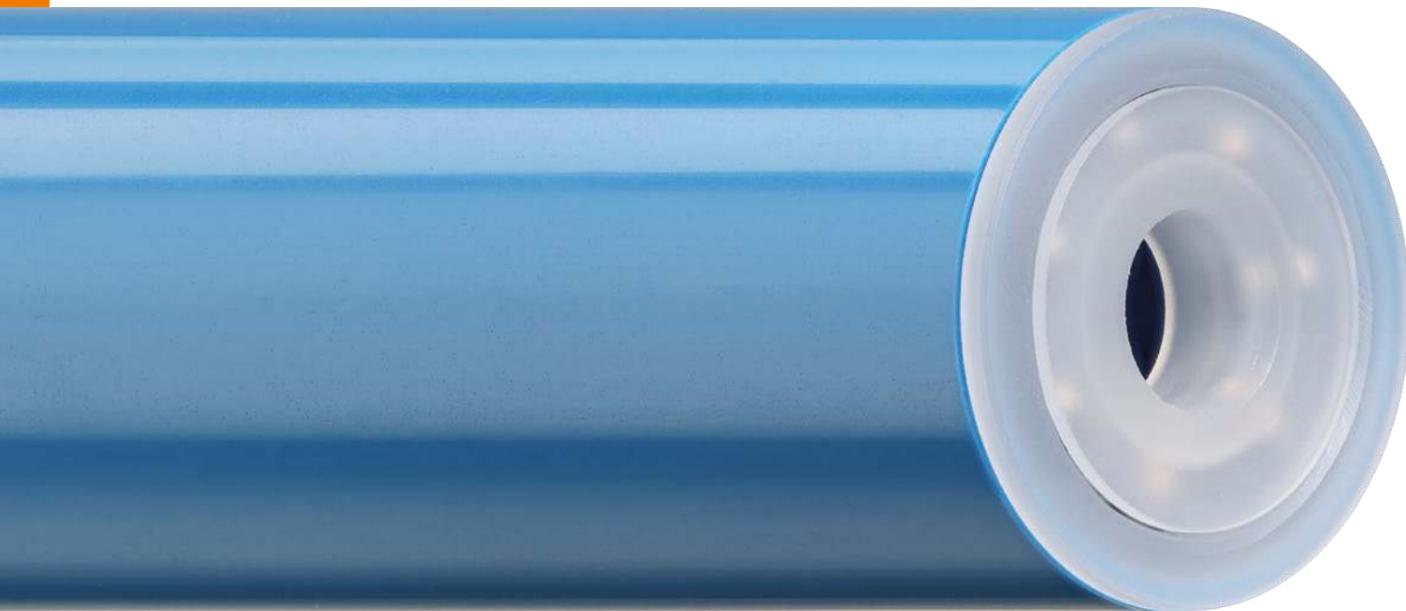
## Catalogue

Find out everything you need to know about xiros<sup>®</sup> ball bearings. Take a look at application examples and additional information. MAT0075654.20

# igus.eu/news-xiros

PVC conveyor roller with C160 flanged ball bearings

# For battery production



**New** #packaging

## The all-rounder for material handling with chemical contact

PVC conveyor roller with C160 flanged ball bearings

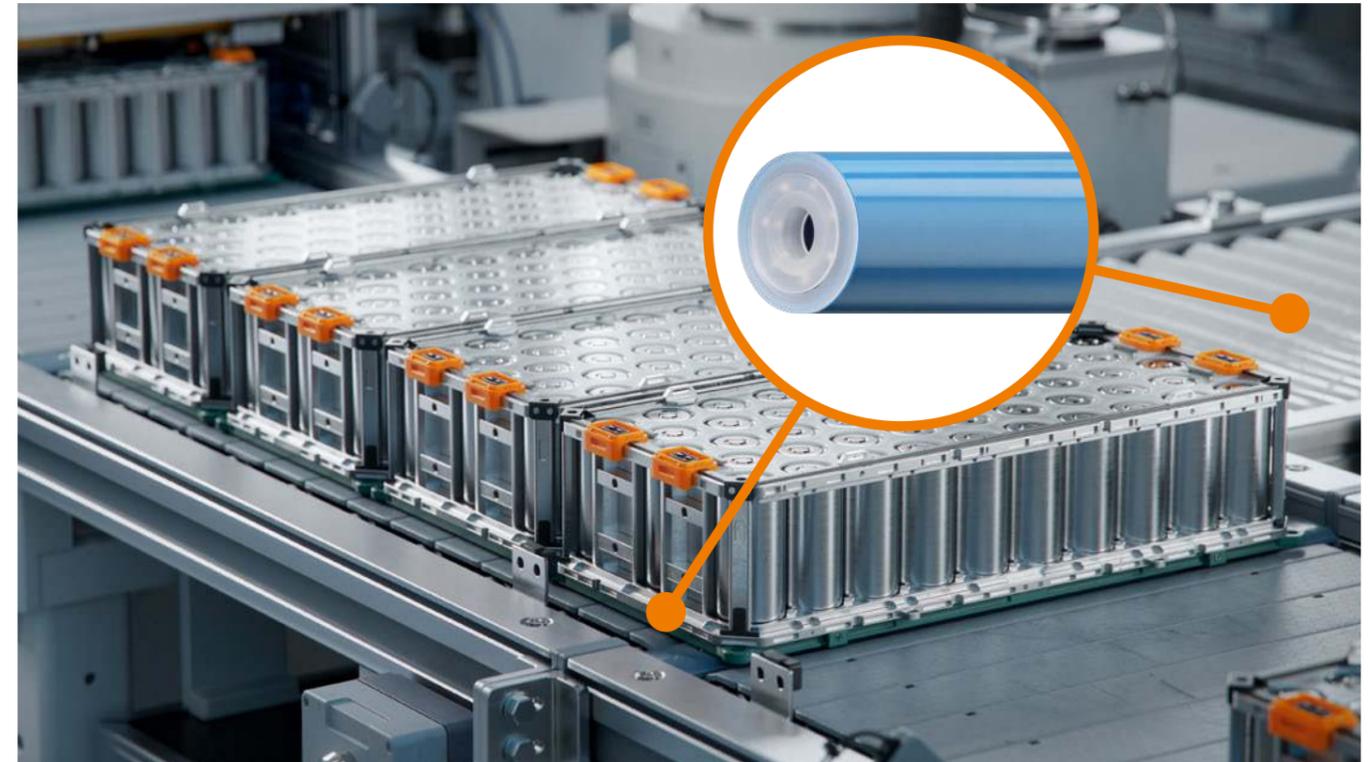
The new PVC conveyor rollers with C160 ball bearings are the perfect solution when it comes to transporting goods in the chemical industry, such as rechargeable batteries or batteries.

- ▲ Extremely resistant to chemicals
- ▼ Ready-to-install system eliminates expensive in-house production
- Tested and developed thanks to specific customer request
- igus® has been an investor in Mura Technology from the very beginning, and is advancing chemical recycling. From plastic waste to crude oil in 20 minutes: [igus.eu/hydroprs](https://igus.eu/hydroprs)



Interview with Lena Wölke-Glomb, Material Developer xiros®

## News from the xiros® laboratory



Lithium-ion battery module on a production line

**Journalist:** Hello, Mrs Wölke! Thank you for taking the time for this interview. We are excited about the new product you have developed. Could you please tell us more about the product?

**Lena Wölke:** Of course! Our latest development is a conveyor roller with C160 flanged ball bearings. This arose from a customer enquiry in the laboratory automation sector who deals with wet chemical processes. A key feature is its resistance to perchloric acid and ammonium nitrate. The product is therefore ideally suited for semiconductor and battery production, among other things.

**Journalist:** Interesting! Why did you decide in favour of a metal-free design?

**Lena Wölke:** Metallic materials, such as stainless steel, can be attacked by perchloric acid. That's why we opted for the xirodur® C160 material for the flanged ball bearings. Not only is it resistant to chemicals, but it is also a cost-effective

alternative to our more expensive heat-resistant all-rounder xirodur® A500.

**Journalist:** What temperatures can the product withstand?

**Lena Wölke:** The long-term application temperature is +80°C, while the lower limit is 0°C. Short-term temperatures of +110°C are even conceivable. This makes the conveyor roller very versatile.

**Journalist:** And how does this new product fit into the existing portfolio of conveyor rollers?

**Lena Wölke:** We are adding this further variant to our PVC conveyor roller portfolio to meet our customers' requirements. The conveyor roller with C160 flanged ball bearings offers a reliable solution for demanding applications in laboratory automation. Customer enquiries result in great products that don't just have to be regarded as special parts, but also find a place in the standard range in the long

term. This means that other customers in these industries can also bring cost down, life up.

**Journalist:** Thank you very much, Mrs Wölke, for these insights into your work at igus®! We are looking forward to further innovations from your team.



**Lena Wölke-Glomb**  
Material Developer xiros®

Ball transfer unit with longer service life

# 30 times more service life



New

## Endurance runners with top wear values

Ball transfer unit with longer service life

This ball transfer unit has a service life that is up to 30 times longer than the standard version, is wear-resistant thanks to the stainless steel ball and runs smoothly thanks to the POM support balls in the housing.

- ▲ Smooth operation: up to 50% less friction compared to the standard version
- ▼ Additional reduction in unplanned downtime saves time and money
- Tested in the xiros® test laboratory: wear rate 30 times better than the standard version
- 100% dispense with any kind of lubrication



Polymer ball transfer units with glass balls

# 100% corrosion-free



New

## Service life increased by factor 20

Polymer ball transfer units with glass balls

This ball transfer unit comes into play for sensitive industrial sectors in conveyor technology where the absence of metal is a must. The POM running ball with glass support balls inside the housing is characterised by a very light operation with an optimised service life.

- ▲ 100% metal-free; very smooth operation: up to 60% less friction compared to the standard version
- ▼ Longer maintenance intervals and gentle transport of goods
- Tested in the xiros® test laboratory: wear rate 20 times better than the standard version
- 100% lubrication-free, clean and hygienic



UCFL flanged ball bearing, 2-hole design

# The UCFL alternative



New

## Lubrication-free flanged ball bearings

UCFL flanged ball bearing, 2-hole design

With the same dimensions as UCFL cast iron housings (UCFL 204/205/206), this flanged ball bearing is the perfect alternative when it comes to 100% freedom from lubrication and loads of up to 860N.

- ▲ Lubrication-free, low maintenance, corrosion-free and lightweight
- ▼ 1:1 interchangeable with standard metal UCFL housings
- Up to 78% less weight than comparable metal UCFL bearings
- Environmentally friendly, no additional lubricants needed



Pillow block ball bearing, narrow design

# Up to 80% lighter



New

## Compact, replaceable and lightweight

Pillow block ball bearing, narrow design

Already known from the igubal® range, but now also available from xiros® in the same housing: compact pillow block ball bearing with spherical, double-row and smooth-running ball bearing that can be screwed on from below.

- ▲ Extremely space-saving with low net weight
- ▼ Improve existing application cost-effectively through 1:1 replacement
- Up to 80% less weight than comparable metal UCFL bearings
- Environmentally friendly, no additional lubricants needed





**New**

## Lubrication-free, low-maintenance

### Ball transfer unit with flange

Our ball transfer units can be fitted with this variant using two mounting holes. The solid plastic housing with stainless steel running ball and POM support balls inside the housing ensure smooth operation.

- ▲ Smooth running
- ▼ Longer maintenance intervals thanks to extended service life leads to lower costs
- Tested and developed in collaboration with our customers
- 100% dispense with any kind of lubrication



**New** #packaging

## Label and film guidance made easy

### Paper guide rings for conveyor rollers with clear anodised aluminium tube

For our food-safe conveyor rollers with clear anodised aluminium tubes, we offer paper guide rings as accessories to prevent film, labels and paper in general from slipping off.

- ▲ Easy to assemble and disassemble
- ▼ No slipping of the paper, which prevents downtime and saves maintenance costs
- Tested and developed in collaboration with our customers
- 100% dispense with lubrication; no washing out of grease in the cleaning process



# GO ZERO Lubrication



**1.7 million hours for lubrication maintenance in escalators. Why? Go zero lubrication! With AI!**

igus





### Municipal vehicle

The vehicle uses side nozzles, a middle section, and electronically switchable high-pressure underfloor nozzles with high water pressure to clean floors.

GO ZERO lubrication ... save lubrication time and costs

# drylin® linear technology



- ▲  
Tech up
- ▼  
Cost down
- Proof
- Sustainability
- Digital

- 186

**Calculate service life in the online tool**  
 Service life guarantee for drylin® linear technology
- 188

**The smallest size available in stainless steel**  
 Miniature linear carriage made of stainless steel
- 192

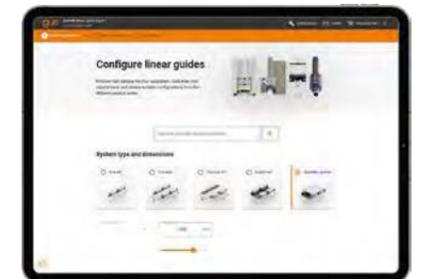
**PTFE-free linear carriages**  
 Extension of the drylin® W linear system
- 197

**Up to 50% cost savings thanks to zinc die-casting**  
 Tandem roller bearings
- 198

**Ready-to-install linear carriages and single bearings for flexible designs**  
 drylin® W-HYD modular system

### Blog topics

- #food, page 21  
motion plastics® for the food industry
- #PTFE, page 22  
motion plastics® for PTFE-free applications



### Online tool

drylin® linear guide expert  
[igus.eu/dlx](https://igus.eu/dlx)



### Catalogue

Find out everything you need to know about drylin® linear technology. Take a look at application examples and additional information. MAT0075657.20

[igus.eu/news-drylin-linear](https://igus.eu/news-drylin-linear)

# 4-year guarantee



drylin® linear Xpert (DLX)

drylin® drive Xpert (DDX)

**New**

## Calculate service life in the online tool

### Service life guarantee for drylin® linear and drive technology

With the online drylin® linear technology Xpert (DLX) and drylin® drive Xpert (DDX) tools, you can check applications, determine the expected service life and order your linear guide or linear axis directly with just a few clicks. With one more click, you will now receive a guarantee for the calculated service life, up to a maximum of 4 years.

- ▲ Direct indication of suitability and service life – with guarantee
- ▼ Planning reliability and suitability of the system
- All calculations and runtime data in the online tool are based 100% on test results determined in the igus® test laboratory
- Certainty of selecting the right components, utilisation until the end of the product life cycle
- 📄 Download the guarantee certificate with the individual application parameters directly [igus.eu/dlx](https://igus.eu/dlx) and [igus.eu/ddx](https://igus.eu/ddx)



Idea to the right product ... guaranteed in just a few steps

## Up to 4-year guarantee on linear guides

Are you looking for a linear guide for your application? Which is reliable, requires no maintenance, is absolutely clean without any lubrication? Selected, checked and ordered online? With the drylin® online tools, you can do just that. Enter the application parameters, select from the linear systems and add to the shopping cart with the next click. Ordered and delivered.

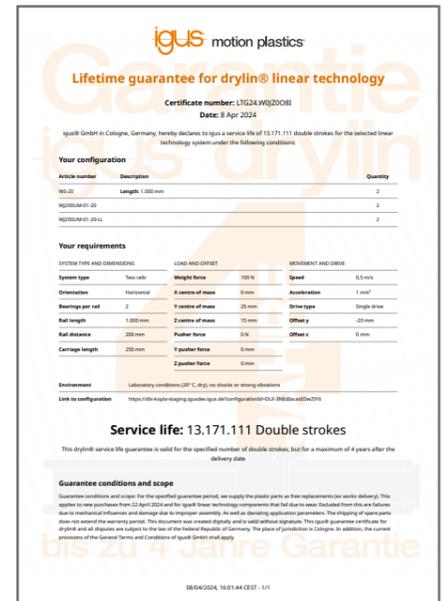
But you get even more ...

- The ready-to-install CAD models are just another click away
- A PDF report on configuration and products
- And brand new this year: a guarantee certificate to download

Because igus® guarantees that the drylin® linear system configured by you will also last for its determined service life. And do so up to 4 years after the delivery date.

All data (drylin® linear guide, configuration parameters, double strokes) are transferred live to the certificate. Simply save, share or print now.

All results in the online tools were determined in series tests in the igus® laboratory. This gives you the certainty that the linear guide you require will do exactly what it is supposed to do – and for as long as it is supposed to. In the online tool you can also set the filtering as desired so that it is pre-sorted live among other things according to service life or the most cost-effective system.



**DLX**

**drylin® W profile guides**

- Ready-to-install linear systems
- Flexible single rails and bearings
- Tough, lightweight, quiet operation
- [igus.eu/dlx](https://igus.eu/dlx)

**DLX**

**drylin® T rail guides**

- Fast alternative to ball guide systems
- Identical connector and hole dimensions
- Automatic clearance adjustment
- [igus.eu/dlx](https://igus.eu/dlx)

**DDX**

**Linear axes with lead screw drive**

- Installation sizes from Ø 6 to 50mm
- Self-locking trapezoidal thread
- [igus.eu/ddx](https://igus.eu/ddx)

**DLX**

**drylin® N low-profile guide system**

- Low profile between 6 and 12mm
- Lightweight
- Rails anodised in silver or black
- [igus.eu/dlx](https://igus.eu/dlx)

**DLX**

**drylin® R shaft guides**

- Compatible with standard recirculating ball bearings
- Replaceable liners
- Wear-resistant
- [igus.eu/dlx](https://igus.eu/dlx)

**DDX**

**Linear axes with toothed belt drive**

- For fast positioning
- For stroke lengths up to 3,000mm
- [igus.eu/ddx](https://igus.eu/ddx)

Miniature linear carriage made of stainless steel

# Modular extension



New

## The smallest size available in stainless steel

### Miniature linear carriage made of stainless steel

For applications that require high corrosion and media resistance. Liners made of the high-performance polymer iglidur® E7 guarantee a high running performance on stainless steel rails.

- ▲ Easy installation and cleaning thanks to monobloc design
- ▼ Complete system from a single source
- It has the identical fixing dimensions as the miniature size 15 with recirculating ball bearings. Suitable double rails made of stainless steel
- 100% dispense with any kind of lubrication. No washing out of grease in the cleaning process
- 🔗 Calculate drylin® W linear guides online [igus.eu/dlx](https://igus.eu/dlx)



### drylin® W linear system

## drylin® W miniature... lightweight, PTFE-free and FDA-compliant

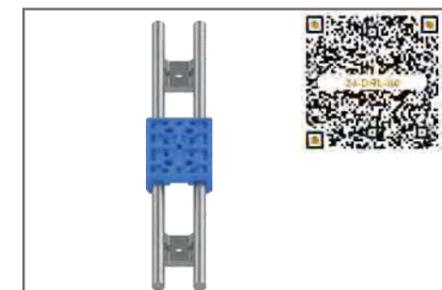
Whether table-top appliances in the kitchen, laser marking systems as table-top appliances, automation in laboratories and surgeries. Everything is getting smaller and more compact, but expectations have risen. Everything should be adjustable, ergonomically in the right position and processes should start at the touch of a button. And preferably without interfering with the workspace and without any maintenance effort. Many systems are also used at a different location after the task has been completed and must be as light as possible for transport or shipping. For linear guides used in such confined environments, these are already a large number of requirements for which we have developed the drylin® W linear guide in size 0620. And the modular system from which users can design their constructions continues to grow. This includes the smallest stainless steel guide in the drylin® W product range to date.

At the Hannover Messe, however, the linear system offers many more new options that can be supplied directly:

- Double rails in silver or black anodised for discreet integration into any superstructure
- Quick changeover from miniature recirculating ball bearing and sliding technology thanks to identical connection dimensions
- Compact miniature carriages made of silver or black anodised aluminium
- Corrosion-resistant miniature carriages made of stainless steel
- Double rails made of stainless steel
- Lightweight and cost-effective econ plastic carriages
- Econ solid plastic carriages made of PTFE-free material
- Econ plastic carriages made of FDA/EU10/2011-compliant material
- Compact linear actuators with dryspin® lead screw technology and drylin® E electric motors
- XY table for manual and electrical adjustment in two directions for a surface of 100x100mm



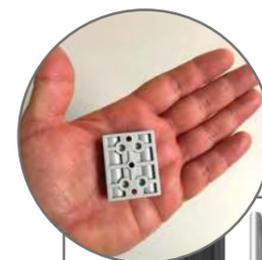
**Michael Hornung**  
International Product Manager  
drylin® linear and drive technology



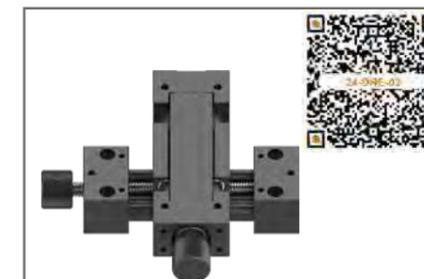
**Miniature carriage made of iglidur® A230**  
Small and light for the food industry  
▶ Page 190



**Three-part polymer extension**  
Metal-free, PTFE-free telescopic extension  
▶ Page 196



**Extension of the drylin® W linear system**  
Small linear carriage, PTFE-free  
▶ Page 192



**Miniature XY table in two versions**  
Two adjustment directions in the smallest installation space  
▶ Page 218



**drylin® linear actuator SLWC-0620**  
Compact motorised linear module for the smallest installation spaces  
▶ Page 219



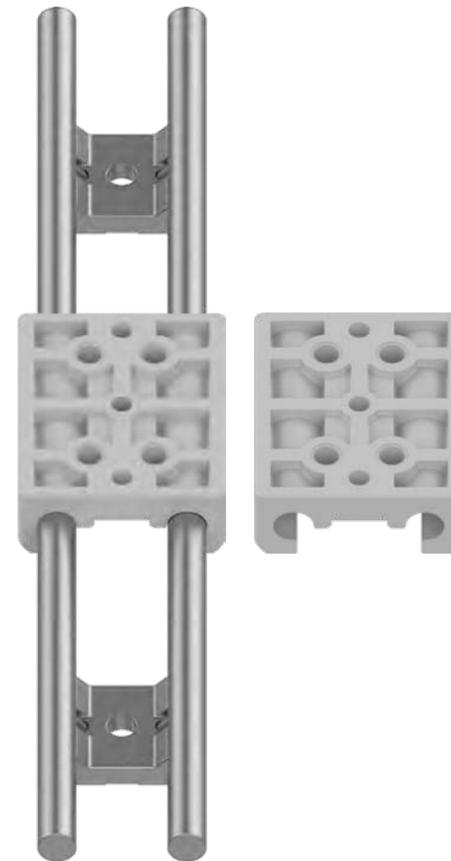
New #food

## Corrosion-free stainless steel

Double rails WS-06-20-ES

The smallest drylin® W double rail made of stainless steel for special requirements: Water contact (seawater, splash water, underwater), cleaning, chemicals, temperatures. The new rails are made from 316 stainless steel (AISI 316Ti) and are robust and durable.

- ▲ Corrosion resistance for the smallest spaces
- ▼ Fast and simple cleaning processes
- Save 30% installation space compared to installation size 10-30 (WW-10-30-T415-ES)
- 100% lubrication-free, clean and hygienic
- Calculate linear guides online [igus.eu/dlx](https://igus.eu/dlx)



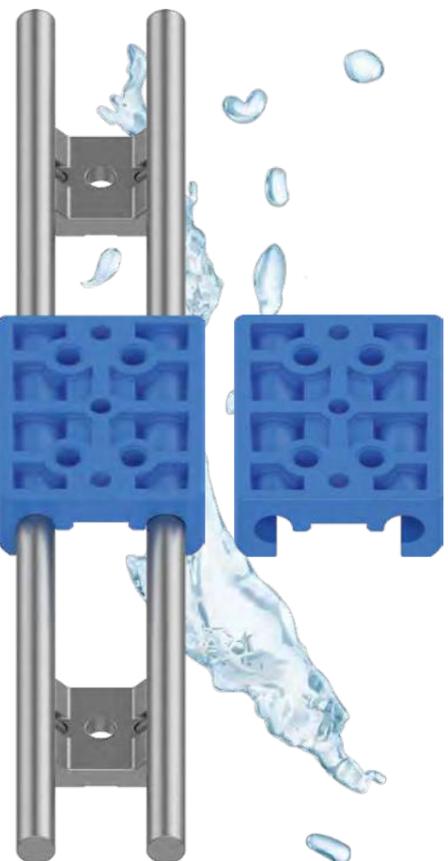
New #PTFE

## Small linear carriage, PTFE-free

Solid plastic carriage made from iglidur® RN403

At less than 10 grams, the WWP-06-20-04 is the lightest carriage in the drylin® product range. The small econ drylin® W linear carriage with its compact design of 32x40x14mm (WxLxH) is ideal wherever installation space and lightweight construction are required at an affordable price.

- ▲ Quick assembly, easy storage
- ▼ Economical due to injection moulding production
- Save at least 65% in weight compared to aluminium miniature carriages WWW-06-20-T415-AL
- PTFE-free, PFAS-tested



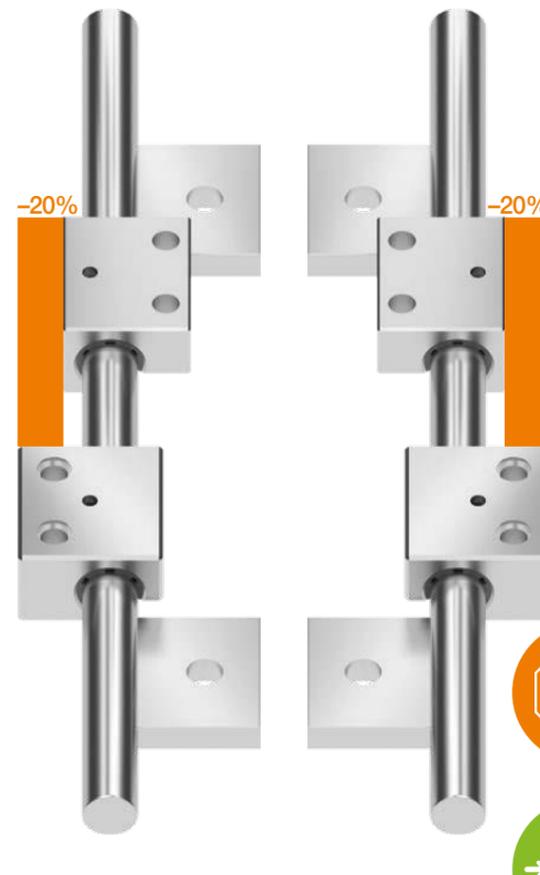
New #food

## Small and light for the food industry

Miniature carriage made of iglidur® A230

Light and compact linear carriages made of the iglidur® polymer A230 are now also available to match the new drylin® W double rail WS-06-20-ES made of stainless steel. The carriage fulfils the conformity requirements for use in the food and pharmaceutical industries. Quick assembly and disassembly, very easy to handle and clean in small spaces.

- ▲ FDA and EU10/2011-compliant, very good optical detectability
- ▼ One Step Assembly ... assembly in one work step
- Weight saving of up to 75% compared to WW-06-20-T415-ES made of stainless steel
- 100% dispense with any kind of lubrication



New #food

## Save 20% installation space

Narrow linear housing WE7UMS-01-Ø

Corrosion-resistant and robust. The new slimline drylin® W linear housing made of stainless steel in four sizes. For all drylin® W single and double rails in round, size Ø10-25mm.

- ▲ Corrosion-resistant, against chemicals and media due to housing made of 316 stainless steel (AISI 316Ti)
- ▼ Seven liner types for all user areas (incl. service life/temperature/FDA/PTFE-free/recycled)
- Save up to 20% installation space compared to standard housings due to internal hole e.g. WE7UM-01-16-ES-FG with rail WS-16: 52mm, WE7UMS-01-16-ES with rail WS-16: 42mm
- Clean and hygienic due to no need for lubrication



# Linear technology – PTFE-free



WWP-06-20-04

WWP-06-20-04

WWP-06-20-04

WWP-10-30-06



**New** #PTFE

## PTFE-free linear carriages

Extension of the drylin® W linear system

Linear technology for applications that require 100% PTFE-free materials and also fulfil low fogging requirements. Linear carriages and rails fulfil these requirements and offer a PTFE-free alternative, especially in areas where restrictions are possible.

- ▲ Extremely lightweight linear carriages
- ▼ Super-fast installation thanks to monobloc design
- PTFE-free, PFAS-tested through the use of iglidur® RN403
- 100% dispense with any kind of lubrication



### drylin® linear technology

## Linear carriages and rails ... PTFE-free, PFAS-tested, econ injection moulding

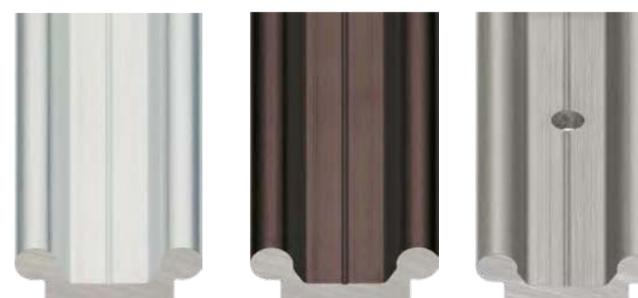
igus® is taking an innovative approach to PFAS with its drylin® linear technology product range and is increasingly focussing on PTFE-free and PFAS-tested materials as linear carriages and sliding elements for shafts and rails. These materials enable low-wear and low-friction running without the need for additional lubrication or seals. PTFE-free alternatives to PTFE-lubricated recirculating ball bearing guides are becoming increasingly important in various industries, from medical technology to automotive and aircraft interiors. PTFE is still not considered harmful to health or the environment. The legal situation regarding PFAS is also still unclear. In order to be able to offer customers the safest and most transparent solution possible right now, igus® is testing its own materials according to the SQP M1227 (LC-MS/MS and GC-MS) / SOP M1227 (LC-MS/MS and GC-MS) test methods for approximately 100 of the most important PFAS compounds that it believes are likely to be subject to future restrictions.

igus® will be presenting the latest product developments in the field of PTFE-free and PFAS-tested linear technology at the Hannover Messe:

- drylin® W – econ linear carriage, in miniature in size 0620 and in size 1030. With or without pre-tension
- drylin® T – four sizes with manual clearance adjustment, with the same dimensions as recirculating ball bearings for quick changeover from rollers to slides
- drylin® NSV – the somewhat different linear guide for controlled adjustment and defined displacement forces
- drylin® NT – telescopic rails as an all-plastic version with an extension of 125mm or with aluminium guide rails up to an extension of 600mm



Marco Jaekel  
Development drylin®



drylin® linear rails with a hard anodised, clear and black anodised surface are also PTFE-free and PFAS-tested.



**High performance carriages**  
PTFE-free linear guide:  
switch from rolling to sliding  
▶ Page 195



**NWV prism carriages**  
PTFE-free, for consistent running  
▶ Page 194



**PTFE-free telescopic rail**  
NT-35 series telescopic slides  
with PTFE-free centre rail  
▶ Page 195



**Three-part polymer extension**  
Metal-free, PTFE-free telescopic  
extension  
▶ Page 196



**Update**

## ROHS-3 REACH-compliant

### drylin® rails

All drylin® linear guides and brass inserts for drylin® N and NSV are RoHS-3 and REACH-compliant.

- ▲ Silver or black anodised
- ▼ Everything from a single source, PTFE-free complete systems
- Clear and black anodising is PTFE-free
- Existing linear guides can be retrofitted with PTFE-free sliding elements or carriages; this also applies to pre-load prism slides



**New #PTFE**

## PTFE-free linear guide: changeover from rollers to slides

### High performance carriages

All four sizes of the TW-42 series impress with their PFAS-tested/PTFE-free operation in addition to their easy handling and assembly. TW-12 Performance carriages already in use can also be converted to PTFE-free by changing the sliding elements if required.

- ▲ Identical connection dimensions and system heights simplify the changeover from standard recirculating ball bearing guides to drylin® T linear carriages
- ▼ Quick changeover due to equal dimensions
- PTFE-free through the use of iglidur® RN403
- 100% elimination of lubricants



**New #PTFE**

## PTFE-free, for consistent movement

### NWV prism carriages

In addition to the flat design, the drylin® NSV pre-load prism slide offers variable spring preloads. Users thus define the desired drive forces and adjustments without any stick/slip effect. All linear carriages with threaded and through holes are now also available with PTFE-free sliding elements made of iglidur® RN403.

- ▲ Controlled adjustment thanks to individual pretension
- ▼ Compatible with many systems: standard and long carriages with plain or threaded hole
- Average driving forces and guaranteed holding forces tested in the igus® laboratory. Threaded inserts and matching prism rails are REACH-3 and ROHS-compliant
- We currently classify the tested iglidur® materials as PTFE-free



**New #PTFE**

## PTFE-free telescopic rail

### NT-35 series telescopic slides with PTFE-free centre rail

drylin® NT-35 telescopic rails can be extended to a length of 600mm absolutely quietly and without any lubrication. Whether as full, partial or over-extension, NT systems slide cleanly and maintenance-free and completely dispense with lubricated balls. The polymer centre rail is now also available in PTFE-free iglidur® GLW.

- ▲ Metal-free centre extension
- ▼ Millimetre-precise full extension, partial extension and over-extension
- Tested in the igus® laboratory
- 100% lubrication-free



Three-part polymer extension

# Metal and PTFE-free



New #PTFE

## Non-metallic, PTFE-free telescopic extension

Three-part polymer extension

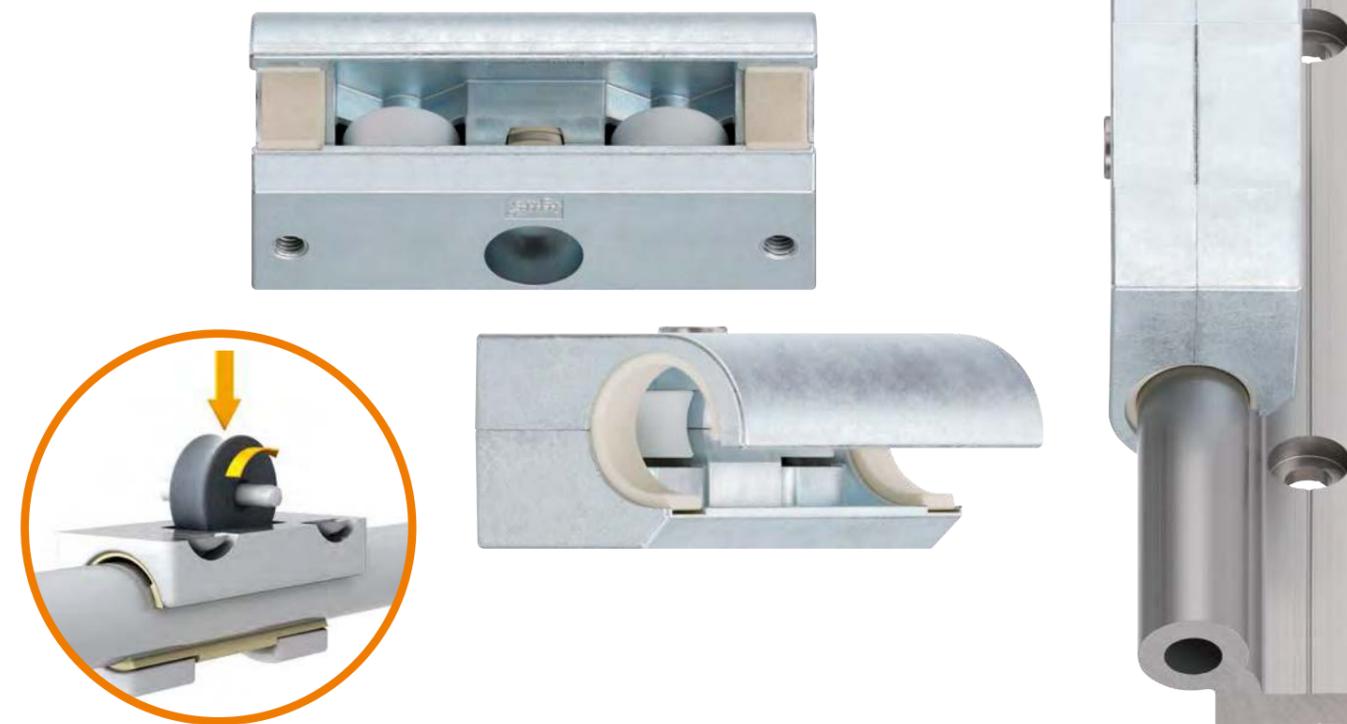
Probably the lightest telescopic rail, the NTP-27 with 125mm full extension weighs just 45 grams. Equipped with a smooth-running spring pre-tensioning element, it is quick and easy to fit. And the NTP polymer extension is now also available with PTFE-free components

- ▲ Non-metallic telescopic extension, full extension length 125mm
- ▼ Cost-effective production in injection moulding
- Tested in the igus® laboratory. 25N static as drawer extension on both sides
- 100% lubrication-free, 100% PTFE-free, PFAS-tested



Tandem roller bearings

# Move loads easily



New

## Up to 50% cost savings thanks to zinc die-casting

Tandem roller bearings

Compared to the hybrid roller bearing with single roller, the tandem roller bearing accommodates double the load. The integrated pendulum mounting ensures that the rollers absorb the load evenly.

- ▲ Uniform load distribution due to the system of guide rollers with pivoting bearing. Optional dirt wiper for heavy-duty applications
- ▼ Cost savings thanks to zinc die-cast housing
- Horizontal structure with 4x tandem bearing WJRM-51-20, 2 rails WS-20 with a spacing of 1,000mm, bearing spacing 500mm, weight force 250N, rail length 2,000mm, 60,790 double strokes
- 100% lubrication-free operation



# Hygienic design

## Corrosion-resistant, hygienic, germ-free



**Mira Heiligenhaus**  
Development Engineer drylin®

### Linear carriage with stainless steel plate

The stainless steel plate is fixed to the single bearings with stainless steel threaded bushings. Compared to cut threads in plastic, this leads to optimised holding forces. Silicone seals are used for sealing.

### All-plastic carriages made from FDA/EU10/2011-compliant igus® high-performance polymers

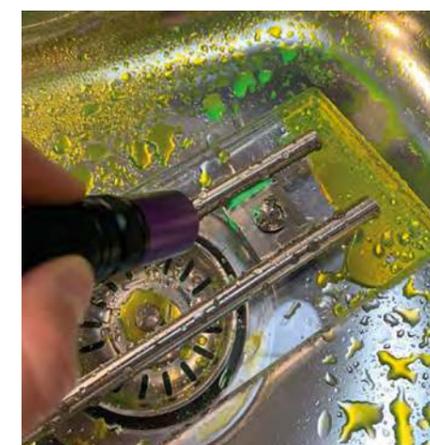
Hygienic design linear carriage for horizontal and overhead installation positions. The special geometry of the drainage areas allows the carriage to be used in a variety of ways and makes it easy to clean at any time. Rapid water drainage is always ensured to reduce the formation of bacteria and germs.

### Stainless steel double rails

The rails have also been optimised to match the design of the bearings and carriages. For the splash zone (zone two in accordance with DIN EN 1672-2), the double rail with bolted support elements without additional seal is sufficient, while zone one requires firmly welded elements with an additional seal to the floor. This means that there is no rough solder seam to which particles could adhere.

In the food industry, a distinction is made between three zones in accordance with DIN EN 1672-2.

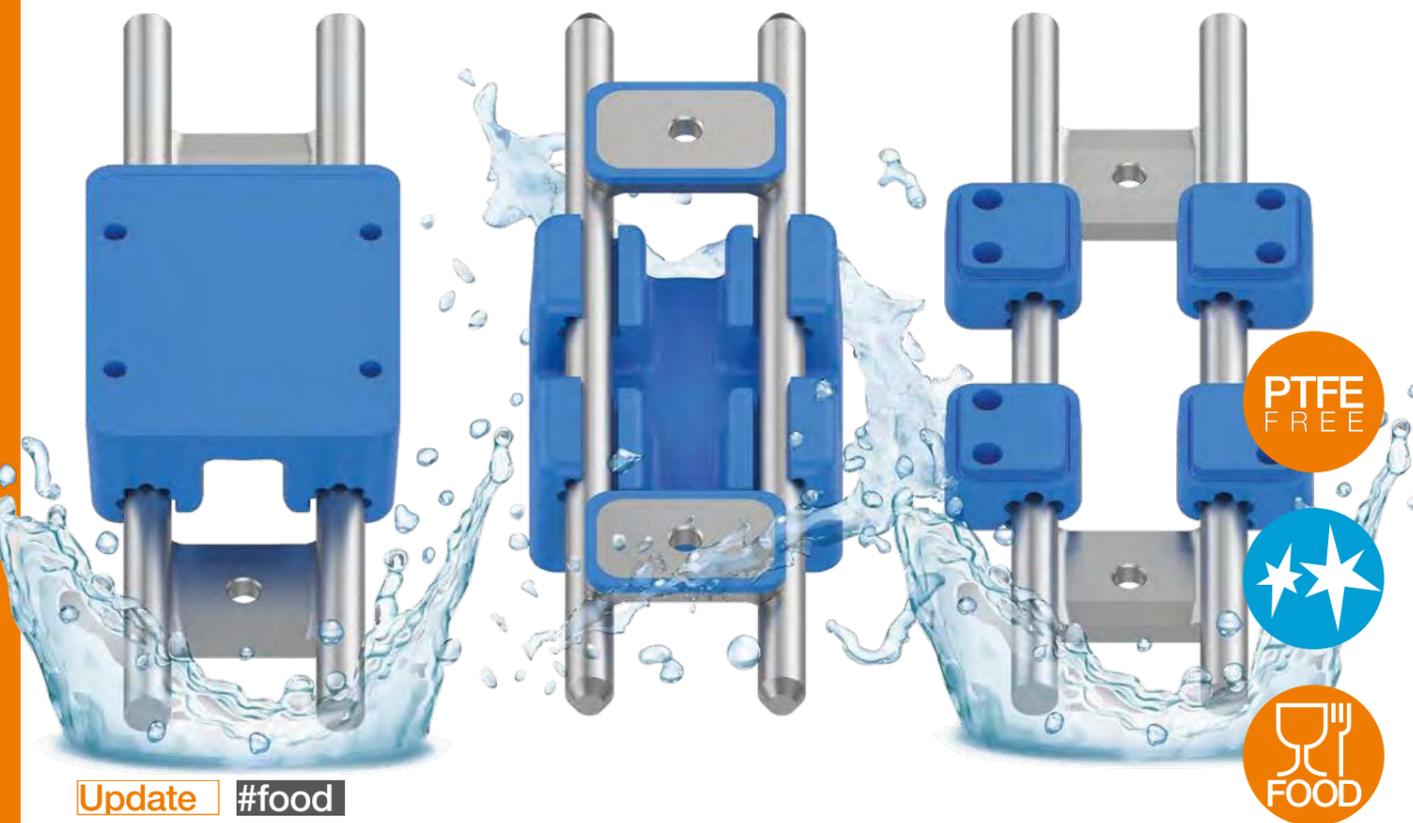
- 1. Food area:** surfaces that come into direct contact with food that can run off or flow into them.
- 2. Splash area:** surfaces on which parts of the food splash or flow along during use, but which do not get back into the food
- 3. Non-food area:** any area other than food or splash area



The drylin® W modular system continues to grow. Following initial studies on linear guides in hygienic design from last year, there is an extension this year. In addition to the design-optimised all-plastic carriage made from a new material, there are now also single bearings for individual requirements. These can be assembled into linear carriages using stainless steel plates in various sizes.

### Single bearings, FDA- and EU10/2011-compliant

The new single bearings are characterised by a rounded, gap-free design with flushing grooves on the bearing surface. Radii greater than 3mm and optimised drainage areas ensure easy cleaning and rapid drainage of water and cleaning agents. The material is FDA-compliant and PTFE-free.



Update #food

## Ready-to-install linear carriages and single bearings for flexible designs

drylin® W-HYD modular system

Linear sliding carriages, linear plain bearings, guide rails in accordance with hygienic design guidelines for simple, fast and hygienic cleaning processes.

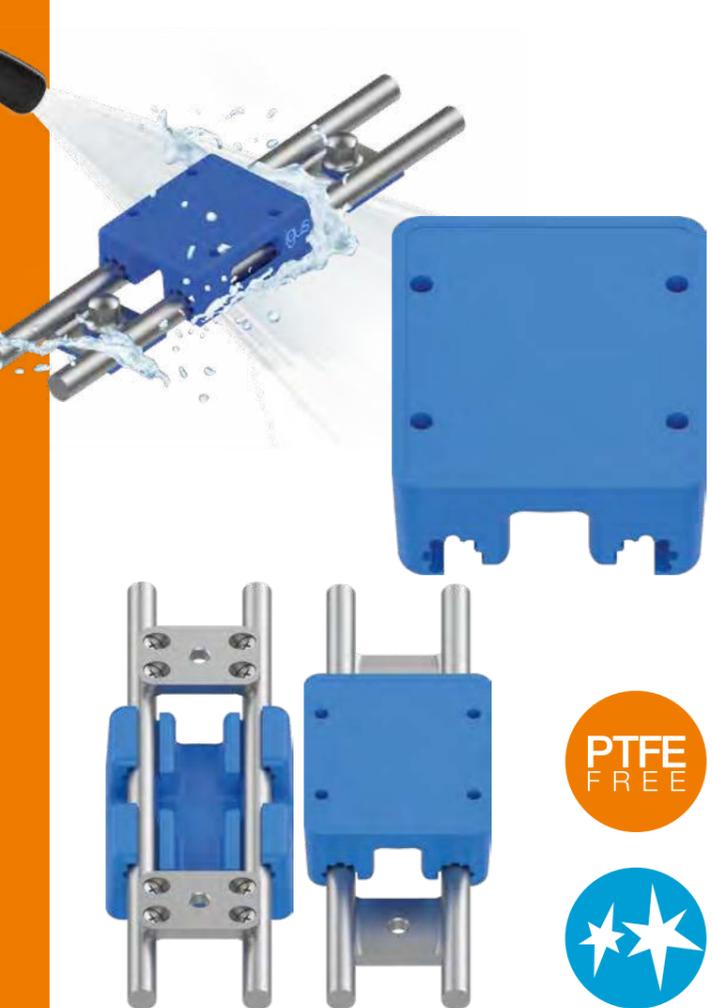
- ▲ All-plastic carriages and single bearings made from FDA/EU10/2011-compliant and PTFE-free materials
- ▼ Hygienic design of all components: Drainage areas, flushable grooves, large radii, gap-free design
- Design based on EHEDG guidelines or DIN EN 1672-2
- 100% dispense with any kind of lubrication



In addition to testing the product design, the hygienic design products are continuously tested in the igus® laboratory, here a wear test with a 12.5kg load.

Optionally with additional seal





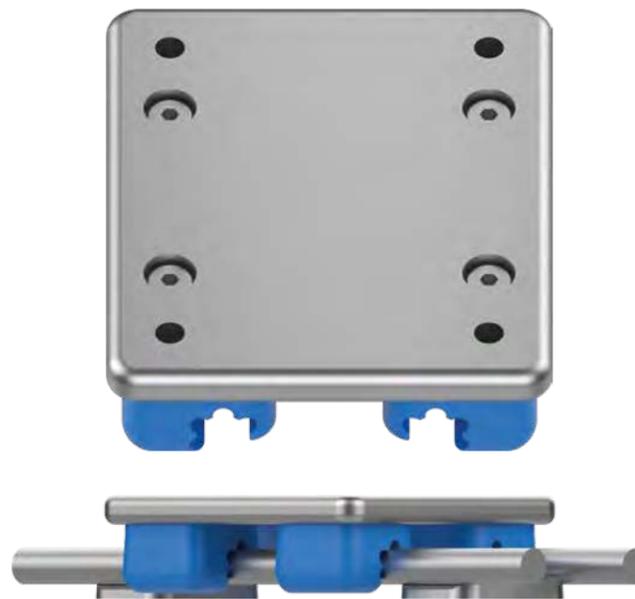
New #food

## Bacteria and germs don't stand a chance

Linear carriage in hygienic design

From study to series production: The new carriages for hygienic design are clean systems with FDA and EU10/2011-compliant components. They have the same dimensions as recirculating ball bearing guides and are particularly easy to clean.

- ▲ Linear guide for efficient cleaning processes, even in overhead applications
- ▼ Hygienic design for all components
- Linear carriages made from FDA/EU10/2011-compliant materials
- 100% dispense with any kind of lubrication



New #food

## Robust, flushable linear carriage

Pre-assembled carriages

Linear system based on hygienic design consisting of a pre-assembled linear carriage for drylin® W stainless steel guides in size 1040, four hygienic design single bearings with flushable gullies on the running surfaces and stainless steel carriage plate for customised centre distance.

- ▲ FDA/EU10/2011-compliant materials, PTFE-free
- ▼ Pre-assembled and ready to install for drylin® W double rail or Ø 10mm round shafts
- Design based on EHEDG guideline or DIN EN 1672-2
- 100% lubrication-free



New #food

## Flexible designs and quick cleaning

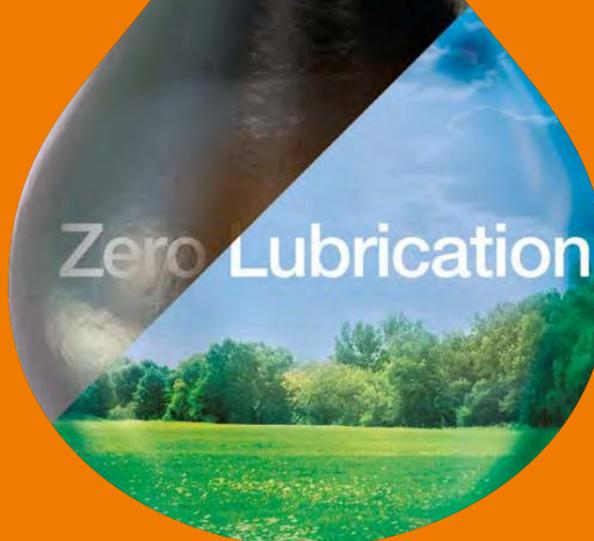
Hygienic design single bearing for flexible designs

drylin® W single bearing in accordance with hygienic design guidelines for flexible designs in food technology. Fast, residue-free cleaning thanks to large flushing gullies and rounded corners and edges.

- ▲ Bearings made of FDA/EU10/2011-compliant and PTFE-free iglidur® polymers
- ▼ Hygienic design of all components: drainage areas, flushable gullies, large radii, gap-free design
- Design based on EHEDG guidelines or DIN EN 1672-2
- 100% dispense with any kind of lubrication

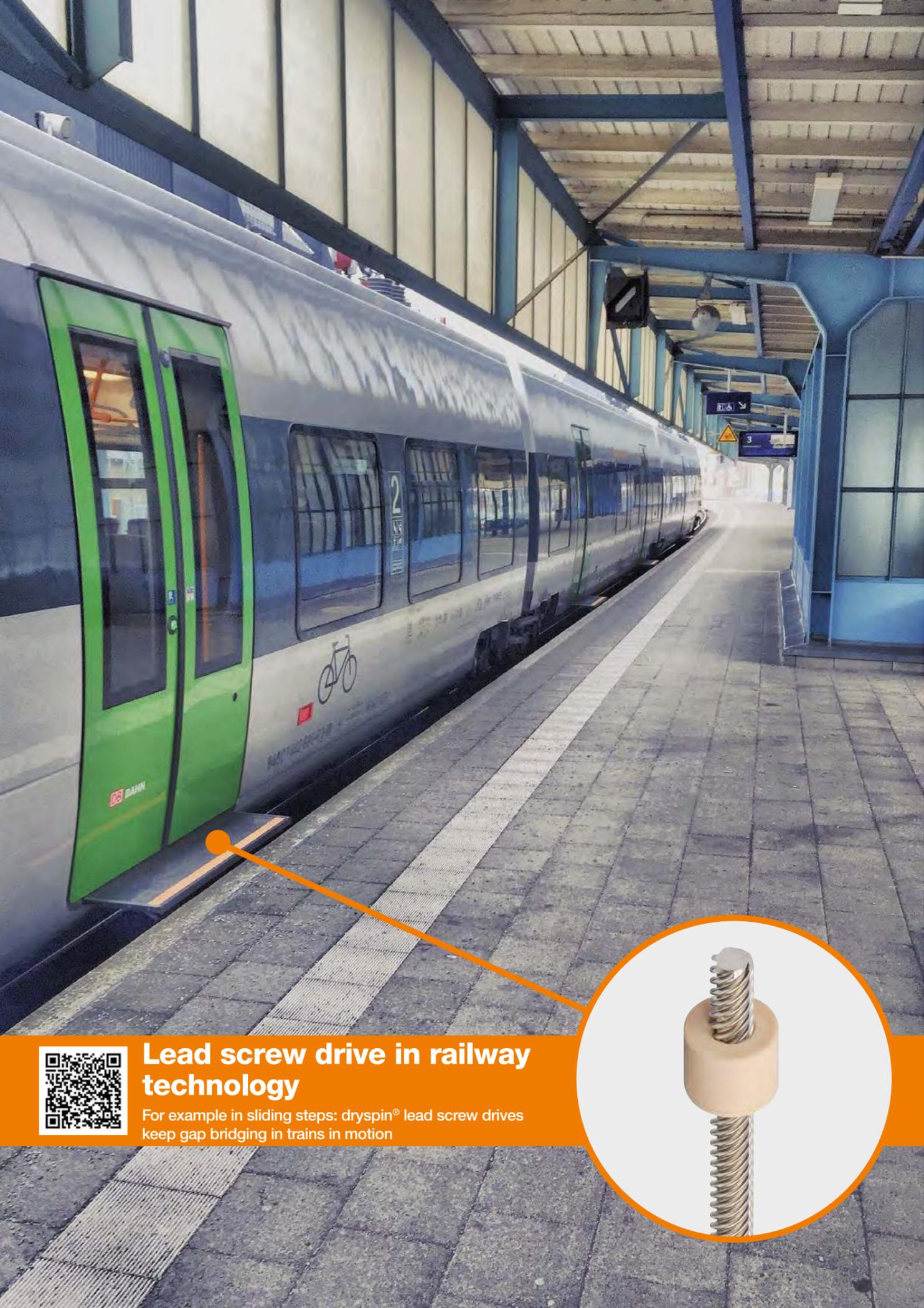


# GO ZERO lubrication



27 million tonnes of lubrication go into water and earth every year. Why? Go zero lubrication! With AI!





GO ZERO lubrication ... save lubrication time and costs

# dryspin® lead screw technology



- ▲  
Tech up
- ▼  
Cost down
- Proof
- Sustainability
- Digital

**204** **Save costs with lead screw systems**  
New dryspin® dimensions:  
extension of the product range

**206** **Lead screw nuts made from bar stock**  
New pitches DS3.5x1 RH, DS20x5 LH and  
DS20x10 LH

**206** **Injection-moulded lead screw nuts with  
machined thread**  
New pitches DS3.5x1-RH, DS20x5 LH and  
DS20x10 LH (machined thread)

**208** **High positional accuracy even without  
external lubrication**  
Thread system solutions for 3D printers

**210** **The proven vibration-damping  
endurance runner without PTFE**  
iglidur® R lead screw nut material

## Blog topics

- #lab, page 19  
motion plastics® for cleanrooms  
and laboratories
- #PTFE, page 22  
motion plastics® for PTFE-free  
applications



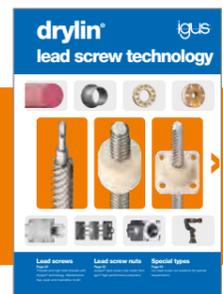
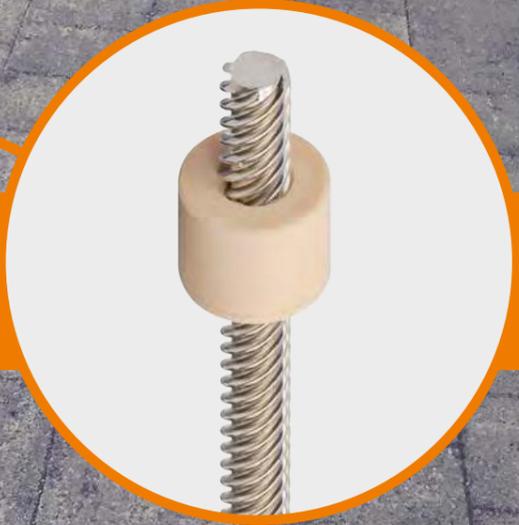
## Online tool

dryspin® lead screw configurator  
[igus.eu/dsk](https://igus.eu/dsk)



## Lead screw drive in railway technology

For example in sliding steps: dryspin® lead screw drives keep gap bridging in trains in motion

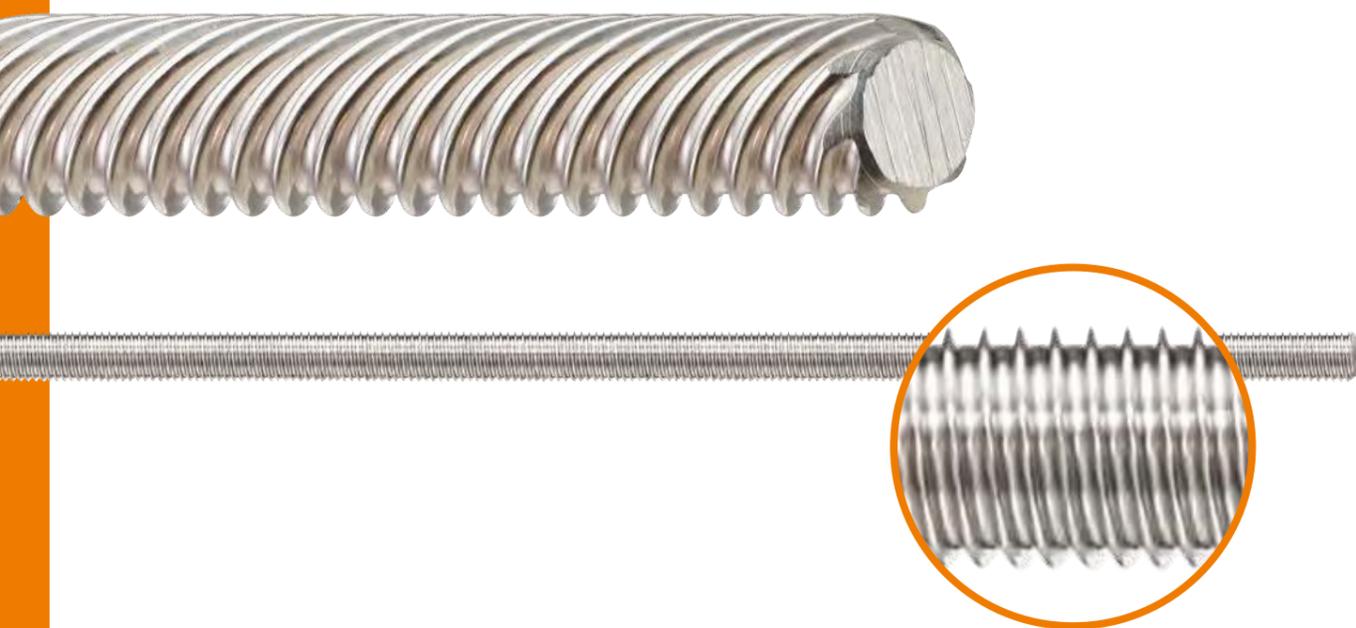


## Catalogue

Available soon: Find out everything you need to know about dryspin® lead screw technology. Take a look at application examples and additional information. MAT0075658.20

# [igus.eu/news-dryspin](https://igus.eu/news-dryspin)

# Smooth, quiet, long service life



Plus #lab

## Save costs with lead screw systems

New dryspin® dimensions DS3.5x1-RH, DS20x5-LH and DS20x10-LH: expansion of the sliding and high helix thread product range

All dryspin® lead screws can be custom-machined. Configure online or send us your drawing. We can quickly provide you with a quotation. The small dimension DS3.5x1 is for our new spindle motor series, which is often used in small installation spaces, such as laboratory equipment.

- ▲ Quiet due to thread geometry, longer service life thanks to asymmetry
- ▼ Up to 30% longer service life thanks to asymmetry
- Ongoing test series in the in-house test laboratory [igus.eu/dryspin-testreports](https://www.igus.eu/dryspin-testreports)
- Lubrication-free operation and easy cleaning because of corrosion-resistant AISI 304 stainless steel
- 🔗 Free online tool for lead screw machining without previous CAD knowledge, including 2D dimension drawing and live price: [igus.eu/dsk](https://www.igus.eu/dsk)



### Background

## dryspin® thread geometry

### Smooth operation, less vibration – THE alternative to trapezoidal threads

#### What does lead screw technology mean and what can I imagine it to mean?

The lead screw technology is a sub-area of drive technology and, roughly speaking, describes the repetitive conversion of a rotating movement into a linear movement within regular cycles. The dryspin® lead screw technology was patented in 2014 by the development team. Particular emphasis was placed on increasing service life and improving efficiency. The dryspin® product portfolio includes high-helix lead screws made of stainless steel or aluminium and the matching lead screw nuts made of igus® high-performance polymers. They are available from 1mm to 100mm pitch. The dryspin® thread geometry is an extension of conventional thread technologies such as metric and trapezoidal threads. dryspin® lead screw technology has many advantages over conventional lead screw geometries.

#### Let us take a closer look:

In contrast to a metric or trapezoidal thread, the high helix thread has a higher pitch. Thus, a significantly increased linear feed is carried out with one revolution of the lead screw. dryspin® offers better efficiency thanks to the specifications and geometries tailored to the plastic nut and lead screw. Efficiencies of up to 82% and a longer service life are achieved compared to metal lead screw drives. In combination with an igus® lead screw nut, clean and dry operation is possible, without dust and dirt getting stuck.

#### We have tested it!

Our dryspin® lead screw geometry is an excellent alternative to conventional trapezoidal threads. The specifications and geometries of our dryspin® lead screw technology, which are tailored to

the iglidur® plastic nut and lead screw, guarantee the well-known advantages: tighter manufacturing tolerances, rounded teeth geometry, optimised flank angle and the asymmetry ideal for plastic nuts compared to DIN 103. Our dimensions are suitable for 1:1 replacement: DS10x2, DS10x3, DS12x3, DS14x4 and DS18x4.

### Tighter manufacturing tolerances – improvement by a factor of three

Trapezoidal threads according to DIN 103 (TR18x4) are tolerated with up to -0.3mm on the outside diameter. Excessive radial clearance can lead to noise and vibration.

Our dryspin® technology guarantees a maximum tolerance of -0.1mm with the same diameter and identical pitch. We improve the outer diameter tolerance by a factor of three and thus optimise smooth operation and precision, especially at high speeds.

### Quiet and vibration-free operation and higher speeds thanks to the rounded tooth profiles of the dryspin® thread geometry

The rounded tooth flanks and tighter manufacturing tolerances of the dryspin® thread geometry reduce noise between the lead screw and nut. This is due to the fact that the greater the contact of two surfaces moving against one another, the more vibrations are transmitted, which can be perceived as a rattle or squeak. This means that higher travel speeds can be achieved without causing the corresponding noise.

### Up to 30% longer service life thanks to asymmetry

Due to the larger distances between the individual dryspin® thread pitches, the thread perfectly adapts to the specifications of the lubrication-free igus® high-performance polymers. The proportion of tribologically optimised polymer in the thread pitches can be

increased by a factor of 1.3. More wear-resistant material and higher efficiency are crucial for a service life that is up to five times longer compared to standard thread geometries.

[igus.eu/dryspin-testreports](https://www.igus.eu/dryspin-testreports)

### Wide range of different types online.

Single or multi-start lead screws with external diameters from 3.5 to 20mm. Pitches from 1 to 100mm. The image compares our dimension DS3.5x1 with DS20x10 in original size.

Simply configure lead screw machining online [igus.eu/dsk](https://www.igus.eu/dsk)





Plus

## Lead screw nuts made from bar stock

New pitches DS3.5x1 RH, DS20x5 LH and DS20x10 LH

The new dryspin® lead screw nuts made from bar stock in a cylindrical, flange or spanner flat version.

- ▲ Quiet operation due to tighter manufacturing tolerances and rounded tooth geometries by default
- ▼ Up to 50.9% more cost-effective than metallic lead screw nuts
- Up to 25% less wear compared to POM+PTFE (dimensions 10X3) [igus.eu/dryspin-testreports](https://igus.eu/dryspin-testreports)
- No lubricating grease or oil in the lead screw drive and long-lasting use thanks to patented asymmetry
- 🔗 Lead screw drive service life can be calculated online [igus.eu/dge](https://igus.eu/dge)



Plus

## Injection-moulded lead screw nuts with machined thread

New pitches DS3.5x1-RH, DS20x5 LH and DS20x10 LH (machined thread)

The new dryspin® injection-moulded lead screw nuts in cylindrical or flange version including spanner flats.

- ▲ Quiet operation due to tighter manufacturing tolerances and rounded tooth geometries, lead screw nuts including spanner flats by default
- ▼ Cost-effective production in injection moulding
- Up to 25% less wear compared to POM+PTFE (dimensions 10X3) [igus.eu/dryspin-testreports](https://igus.eu/dryspin-testreports)
- No lubricating grease or oil in the lead screw drive and long-lasting use thanks to patented asymmetry
- 🔗 Lead screw drive service life can be calculated online [igus.eu/dge](https://igus.eu/dge)



# dryspin® lead screw configurator

## From the idea to the configured lead screw in less than five minutes

- Includes plausibility check
- Individual pin machining without CAD software
- 2D dimensioned drawing and 3D step file, generated directly online
- Immediate price calculation with online ordering
- Time savings thanks to clear drawings and fast delivery times



[igus.eu/dsk](https://igus.eu/dsk)

# Minimal clearance



PTFE  
FREE

3D

New

## High positional accuracy even without external lubrication

### Thread system solutions for 3D printers

Lead screw systems are at the heart of every DIY 3D printer. They guarantee precise positioning of the print bed, are maintenance-free and durable.

- ▲ Consistent minimum axial clearance for high positional accuracy
- ▼ More cost-effective due to the elimination of lubricants and a longer service life
- Less axial clearance due to optional lead screw nut spring pre-load
- No grease or oil in the lead screw drive



### Application example

## Lead screw systems in 3D printers

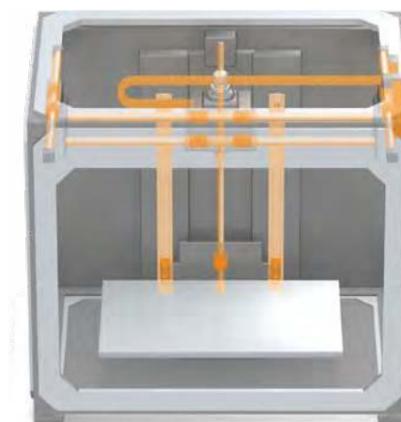
**igidur® thread systems: the way to perfect coatings and lubrication-free movement.**

Lead screws are often found in 3D printers that require low speed and high precision and are often used to control the positioning of the print heads or the print bed.

### Why do metal-to-metal solutions need to be lubricated?

Metal-to-metal solutions are lead screw systems in which both the lead screw and the nut are made of metal. These solutions are robust and durable, but also have the disadvantage of generating a lot of friction, which leads to wear, heat and noise. To reduce these negative effects, metal-to-metal solutions must be lubricated regularly. The lubrication reduces the friction between the thread surfaces and protects them from corrosion. Lubrication can be achieved by various methods, such as oiling or greasing. The choice of the appropriate lubrication method depends on various factors, such as type of lead screw, ambient temperature, load and speed of the system. Incorrect or insufficient lubrication can lead to increased wear or failure of the lead screw system.

Lead screw systems are an important component in many 3D printers, enabling the linear movement of the print bed, for example. Lead screw systems have several advantages over other drive types such as toothed belts. They are precise,



robust, quiet and low-maintenance. They can also transmit high forces and are robust. Lead screw systems are mainly used in 3D printers that work with fused deposition modelling (FDM) or stereolithography (SLA). These processes require a high degree of accuracy and repeatability of the printing movements so as to produce high-quality objects. Lead screw systems are therefore an ideal solution for these applications. They can transmit high forces, which is useful for printing large or heavy objects. Furthermore, they are relatively easy to install, maintain and replace.

### Why are lead screw systems so useful for 3D printers?

Well, they enable precise and reliable positioning of the print heads, which apply the molten material layer by layer. The more precise the positioning, the better the print quality.

### How do you choose the right lead screw system for your 3D printer?

This depends on various factors, such as the size of the printer, speed, accuracy and budget. There are different types of lead screws, such as trapezoidal threads, ball threads or high helix threads. Each type has its advantages and disadvantages that need to be considered. For example, ball threads are very fast and precise, but also more expensive and more susceptible to wear than trapezoidal threads. High helix threads are a good alternative as they offer high efficiency and a long service life and are generally found in the same price segment as trapezoidal threads.



### What are the advantages of iglidur® lead screw nuts?

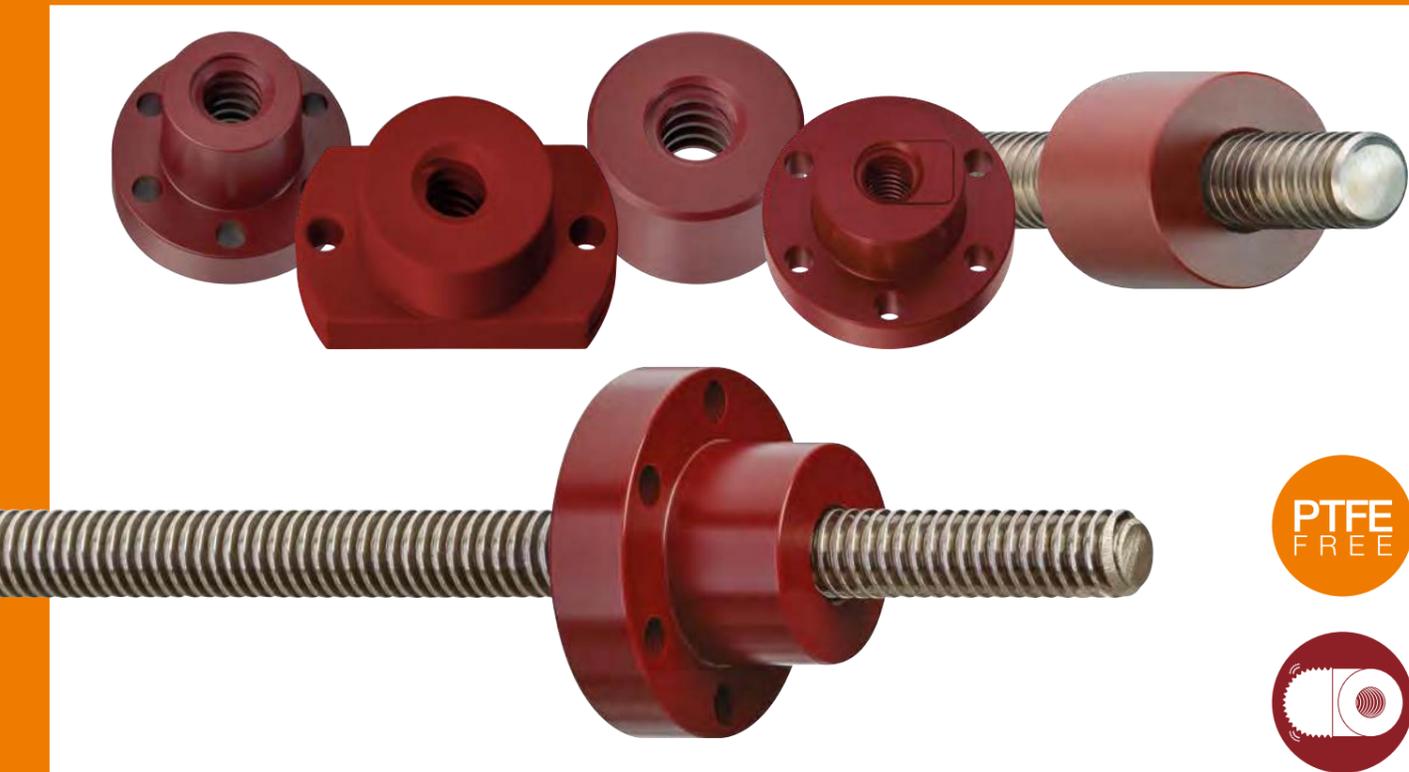
igidur® lead screw nuts are plastic nuts made of tribologically optimised iglidur® high-performance polymers. They have several advantages over metal nuts:

- They are lubrication-free and low-maintenance
- They have lower wear and a longer service life
- They are lighter and quieter
- They are corrosion-free and chemical-resistant
- They generate less heat
- iglidur® R is PTFE-free

igidur® lead screw nuts are available in various shapes (cylindrical or with flange), sizes (from 4 to 24mm diameter) and materials (for different requirements). They can be combined with different lead screw types (trapezoidal, high helix or metric threads).

iglidur® R lead screw nut material

# No vibration, PTFE-free



PTFE  
FREE

Update #PTFE

## The proven vibration-damping endurance runner without PTFE

iglidur® R lead screw nut material

Our iglidur® R lead screw nut material does not include PTFE. The material is safe, durable, predictable and vibration-damping. Our other standard materials J, J200, E7, J350 and W300 have been tested for the approx. 100 most important PFAS compounds according to test method SQP M1227 (LC-MS/MS and GC-MS)/SOP M1227 (LC-MS/MS and GC-MS) and are approved as "PFAS-free" material.

- ▲ Wear-resistant and versatile without PTFE
- ▼ Cost-effective alternative to our all-rounder iglidur® J
- Up to 25% less wear compared to POM+PTFE (dimensions 10X3) [igus.eu/dryspin-testreports](https://www.igus.eu/dryspin-testreports)
- Environmentally friendly thanks to the absence of external lubricants
- 🎯 Lead screw drive service life can be calculated online [igus.eu/dge](https://www.igus.eu/dge)



# Get to know the variety of dryspin®

### dryspin® technology High helix lead screw nuts

**Technical data**

- Pitch: 2,54 - 100 mm
- Efficiency: 86-90,82 %
- Coef. of friction μ: 0,1 - 0,25
- Temperature: -20° up to +150 °C

▶ **Lubrication and maintenance free**  
with the use of igus® high performance polymers

▶ **Insensitive**  
Clean and dry running, resistant to dust and dirt

▶ **Wear-resistant**  
Durable and tribo-optimised dry-tech® polymers

▶ **Reduced clearance**  
Minimum backlash due to zero backlash option

**Types**

- Cylindrical
- With flange/compact flange with spanner flat
- Zero backlash, reduced clearance
- Pre-loaded, low clearance

More Information [www.igus.eu/dryspin](https://www.igus.eu/dryspin)

### dryspin® technology High helix lead screws

**Technical data**

- Pitch: 2,54 - 100 mm
- Diameter: 6,35 - 20 mm
- Pitch accuracy: < 0,08 / 200 mm
- Straightness: < 0,1 / 200 mm

▶ **Efficiency**  
Greater efficiency due to optimised thread angle

▶ **Long service life**  
Longer service life due to asymmetric dryspin® geometry

▶ **Quiet operation**  
Quiet and vibration-free due to round tooth profiles

**Online service**  
Product finder, custom design, service life calculator, online shop ...

**Lead screw material**

- Stainless steel  
corrosion resistant, FDA-compliant, high stiffness
- Aluminium  
lightweight, tribo-optimised, hard anodised, non-magnetic

## Simply request a free sample card.

[igus.eu/dryspin-sample-request](https://www.igus.eu/dryspin-sample-request)





GO ZERO lubrication ... save lubrication time and costs

# drylin® drive technology



Tech up



Cost down



Proof



Sustainability



Digital

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**More loads, more dynamics**  
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**Simple integration in conjunction with Siemens control systems**  
Motor control system D1 with PROFINET

## Blog topics

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motion plastics® for heavy-duty applications

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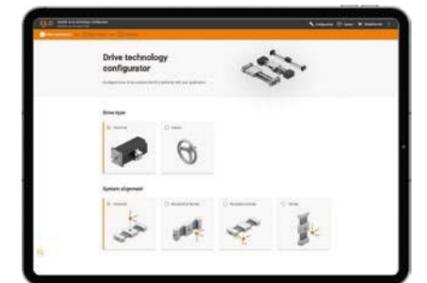
motion plastics® for cleanrooms and laboratories

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motion plastics® for the food industry

**#assembly, page 24**

motion plastics® for easy assembly



## Online tool

**drylin® drive technology configurator**

[igus.eu/ddx](https://igus.eu/ddx)



## Offshore robot

Inspection, cleaning and repair in demanding environments

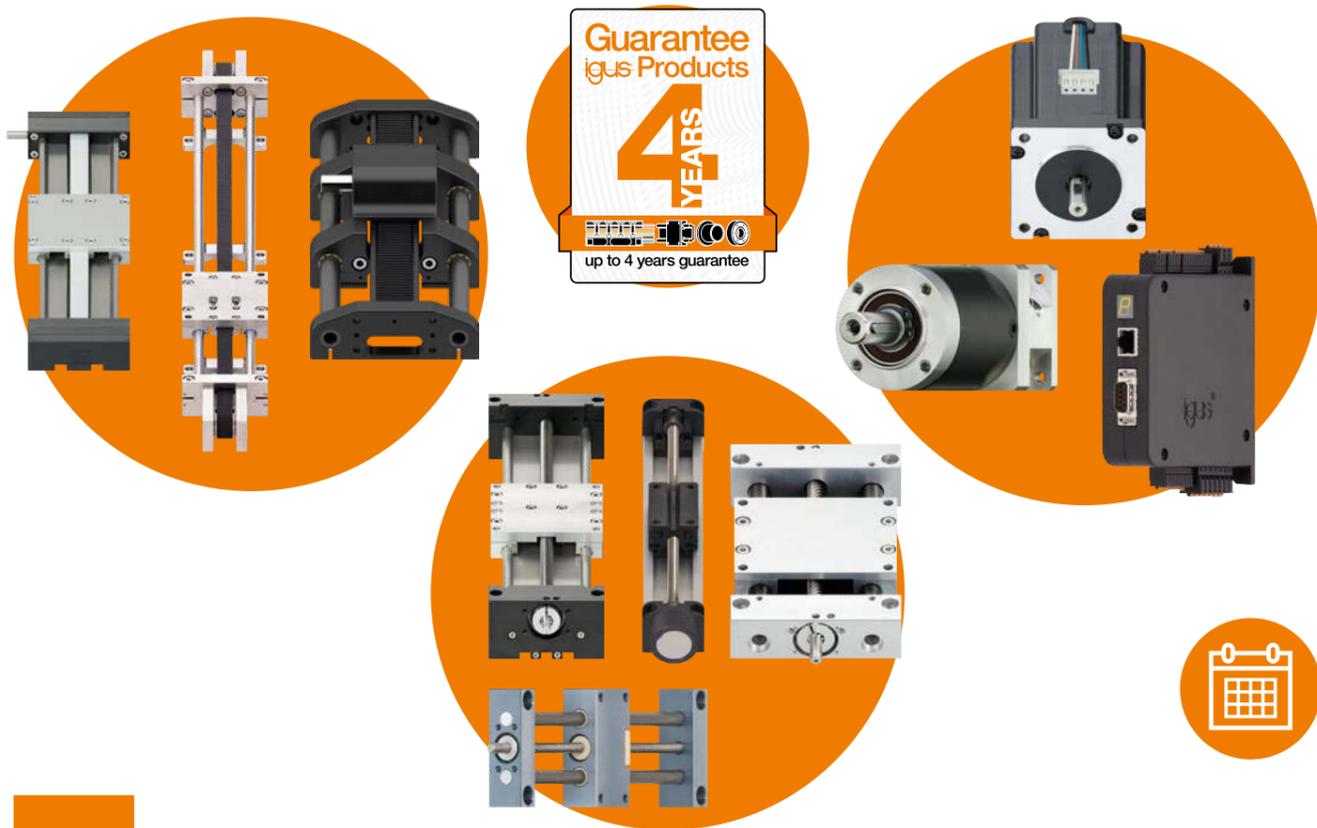


## Catalogue

Available soon: Find out everything you need to know about drylin® drive technology. Take a look at application examples and additional information. MAT0075659.20

# [igus.eu/news-drylin-drive](https://igus.eu/news-drylin-drive)

# Specialists for drive technology



## Implementing innovative projects

### Drive technology roadshow – take the dryway®

The igus® field service team is supported by four specialists for drylin® drive technology. They are specially trained to solve your problems and realise innovative projects.

- ▲ You can get to know and try out our products live with the roadshow van
- ▼ More safety in the conception and faster implementation of your projects
- We test products – you test us: make an appointment now [igus.eu/dryve-support](https://igus.eu/dryve-support)
- Lubrication-free systems with a guarantee for the service life calculated online. We can help you with the design!
- 📅 Book an appointment online: [igus.eu/dryve-support](https://igus.eu/dryve-support), video consultations are also possible



### Your contact on site

## Our drive: Tech up

"The possibilities with drylin® drive technology are various, as diverse as the customer applications themselves. It motivates me to offer our customers real added value. Complete solutions with motor and control system as well as climate test, installation service and much more." Kevin Buettner

### What exactly does the modular drylin® drive technology from igus® include?

The drylin® drive technology offers lubrication-free linear axes that are driven with a lead screw, toothed belt or gear rack. Electric and manual drives via hand wheels or electric motors are possible. In addition to numerous standard designs, at igus® you will also find linear actuators for special requirements, such as lightweight and ready-to-install linear axes made of plastic or solid stainless steel linear modules for heavy loads. All linear drives from igus® drive technology do not require the use of external lubricants. We provide you with suitable solutions for the most individual applications.

The drive systems feature long service life, precision, and high reliability. The drylin® drive technology is also dirt-resistant, lightweight, quiet, and suitable for almost any application and industries from all over the world. All linear modules can also be customised to your requirements in our drive technology configurator. Our preconfigured products are ready to ship from 24hrs. Custom production from 48 hours!

For linear axes and handling systems, igus® offers a wide range of electric motors. Hybrid stepper motors, DC motors and brushless DC motors find their applications in lead screw drives, toothed belts and rack drives. The electric motors complete the range of igus® automation technology. In this way, entire handling systems can be configured in combination with linear axes.

### Our e-dryve specialists for drive technology



**Kevin Buettner**  
North/East

**Eric Bundschuh**  
Baden-Württemberg



**Christof Meurer**  
Central/West

**Fabian Otto**  
Bavaria

Are you looking for a linear axis with a lead screw or toothed belt drive for manual or electric adjustment? Should it function reliably, require no maintenance and work without lubrication? You can achieve exactly that with our online tools. Enter the application parameters, select the right linear module and receive live information on function, service life or motor utilisation, including a guarantee certificate if required.

[igus.eu/ddx](https://igus.eu/ddx)

### drylin® worldwide: from our specialists in Cologne to your experts on site



**Anderson Batista**  
Brazil



**Kevin Huang**  
China



**Aurélien Erson**  
France



**Ashish Rai**  
India



**Edoardo Rivolta**  
Italy



**Koji Soeda**  
Japan



**Sean Kim**  
Korea



**Andreas Kniebeis**  
Austria



**Kamil Niemyjski**  
Poland



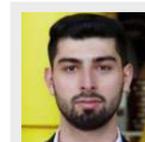
**Ryan Ong**  
Singapore



**Shadi Lara**  
Spain



**Rick Chen**  
Taiwan



**Faruk Özbek**  
Turkey



**Lee Wilkins**  
UK



**Matt Mowry**  
USA



Linear module with dryspin® high helix thread Ø 6.35mm

# Miniature linear modules



Size comparison SLR-40 and SLWC-0620

**New**

## Compact linear modules for the smallest spaces

Linear module with dryspin® high helix thread Ø 6.35mm

Torsion-resistant drylin® W double rail WS-06-20 optionally in silver or black (anti-reflex) in combination with robust carriage and aluminium shaft end supports. For manual and electric adjustments incl. operating elements or ready-to-connect drylin® electric motors.

- ▲ Optionally as a single axis, compact ready-to-connect with lead screw motor or as an XY table for small work surfaces
- ▼ Available in stroke lengths accurate to the millimetre, with optional accessories and motor
- dryspin® lead screw DS6.35x2.54, axial force 200N, stroke length 150mm, speed 150rpm: service life 21,984 double strokes
- 100% elimination of lubricants
- 🔗 Configure drylin® linear modules online [igus.eu/ddx](https://igus.eu/ddx)



Modular system extension

## New installation size saves space

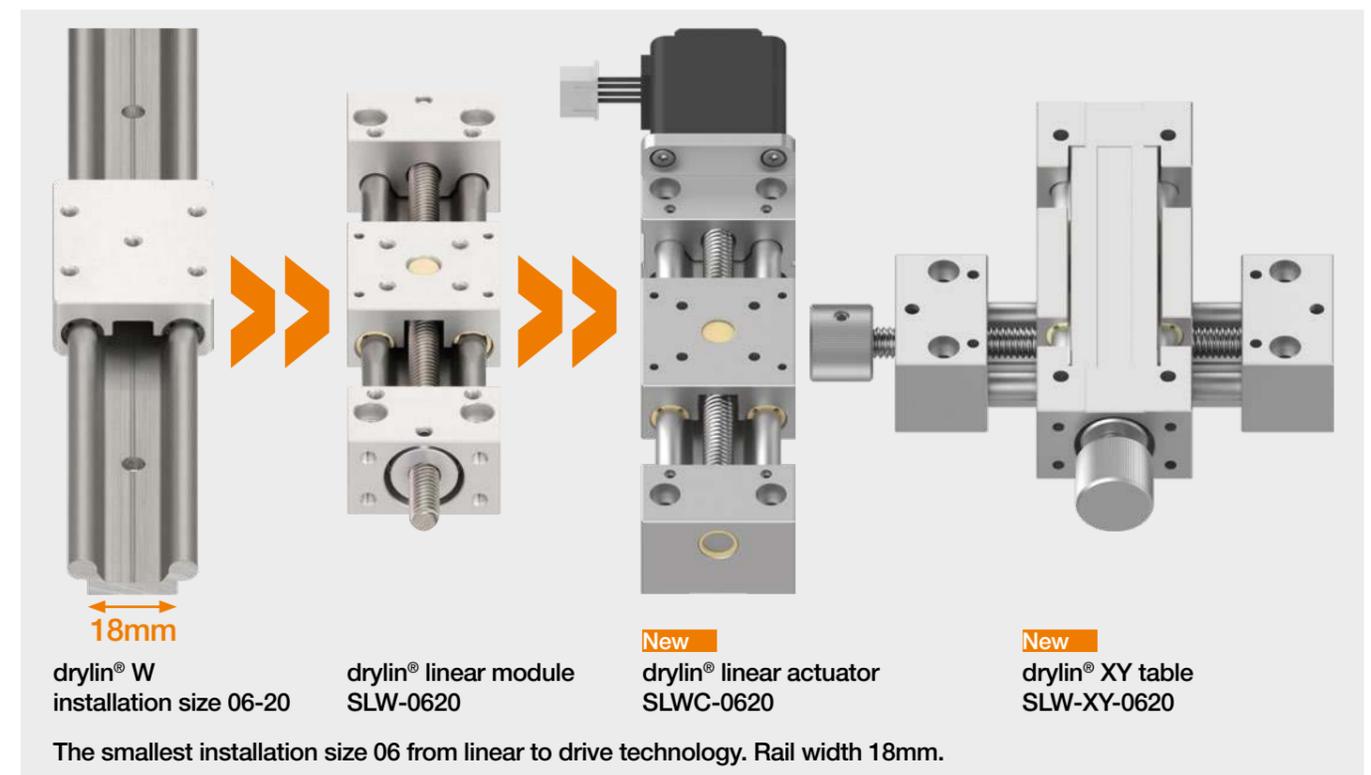
With installation size 0620, drylin® W linear guide systems offer extreme modularity in small installation spaces. This is because applications in measurement technology, automation, kitchen appliances and labelling technology meet the demand for maximum flexibility and ease of use. Many stationary functions are increasingly being adjusted manually or electrically to offer users the greatest possible comfort. In addition, many systems are implemented as table-top structures and should be easy to transport so that they can be used quickly at a different location.

Whether at the next table, at another machine or in another location or country. And it is precisely for this application that igus® has developed the drylin® SLW in installation size 0620. Extremely compact dimensions of 22x32mm that fit into almost any structure. Efficient dryspin® lead screw technology for high precision and running range, in silver or black anodised to match your surroundings. And all completely lubrication-free for a clean and hygienic environment.

We are expanding the modularity of the SLW system at the Hannover Messe with two further variants, which are of course also available in silver or black. The SLWC in installation size 0620 integrates a drylin® E lead screw motor into the system, which means an even more compact design of the lead screw axis. The direct lead screw support saves space for the motor flange and coupling. For users, this fulfils the need for a ready-to-install electric linear module: drylin® W linear guide, dryspin® thread, dryve drive technology with motor and control system. From a single source for all adjustments in the smallest installation spaces. Another new product in the 0620 compact class is the SLW XY table. Two adjustment directions are combined in one linear module. Whether with the same or different stroke lengths, workspaces of 100x100mm can be approached. Adjustments and settings are implemented in the smallest possible installation space with an extensive package of manual operating elements. The new XY table version is now available in black or silver.

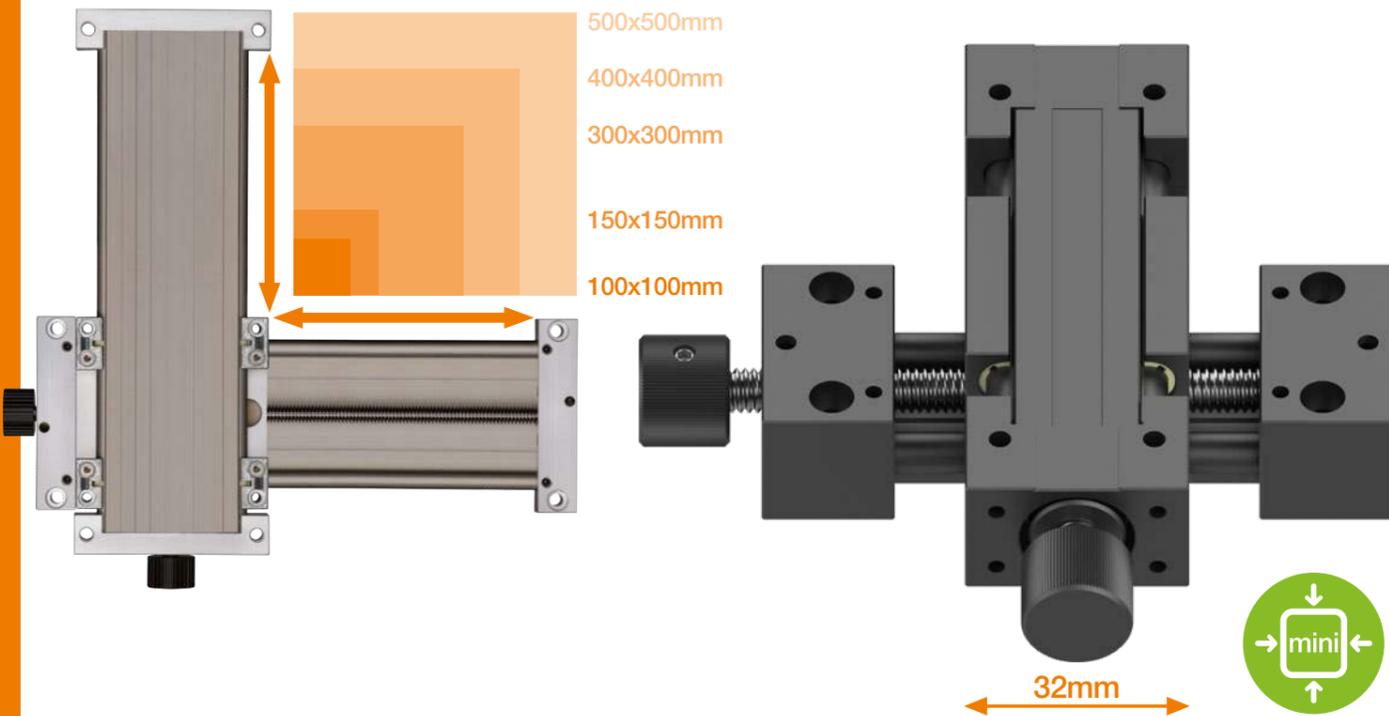
Compact dimensions

- Robust shaft end supports and carriages made of anodised aluminium, silver or black anodised
- Efficient dryspin® lead screw technology with many pitch options
- Powerful NEMA electric motors with or without encoder from dryve drive technology
- 100% lubrication-free thanks to igus® high-performance polymers
- Delivered ready to install from one source



Miniature XY table in two versions

# Surfaces up to 100x100mm



**New** #assembly

## Two adjustment directions in the smallest spaces

Miniature XY table in two versions

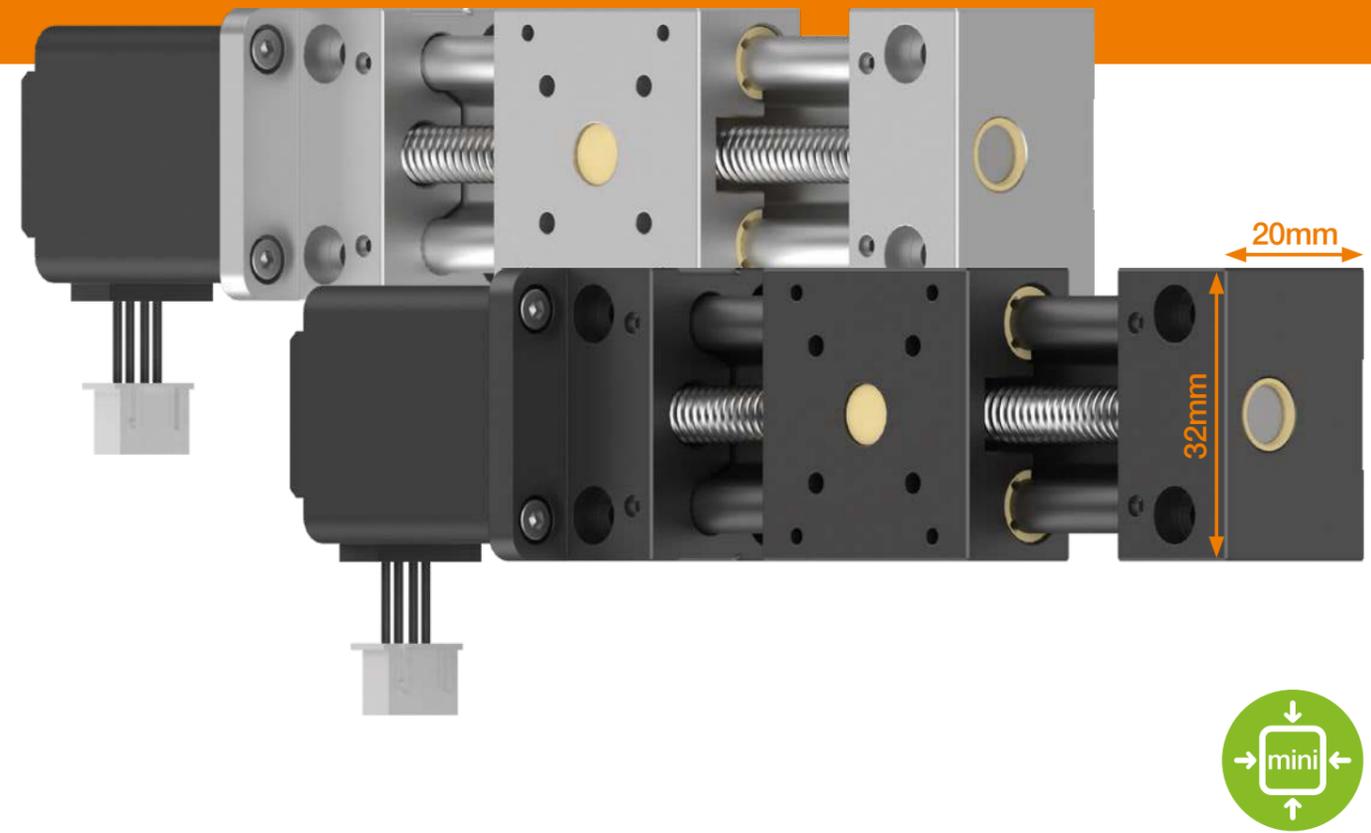
Compact SLW XY tables are now available for adjustment in a workspace of 100x100mm. Each module is only 32mm wide and the entire XY table is only 35mm high and can therefore be used in the smallest spaces. Both adjustment directions can be configured with the same or individual stroke lengths. Suitable accessories can be ordered directly.

- ▲ Available in silver or black anodised
- ▼ One ready-to-install module instead of two individual modules that have to be put together
- Tested in the igus® laboratory: dryspin® DS6.35x1, dynamic axial force 75N, stroke length 50mm, feed 0.08m/min, speed 80rpm, duty cycle 25%, service life 201,063 double strokes
- 100% lubrication-free



Linear module with high helix thread Ø 6.35mm

# Mini with motor



**New**

## Compact motorised linear module for the smallest spaces

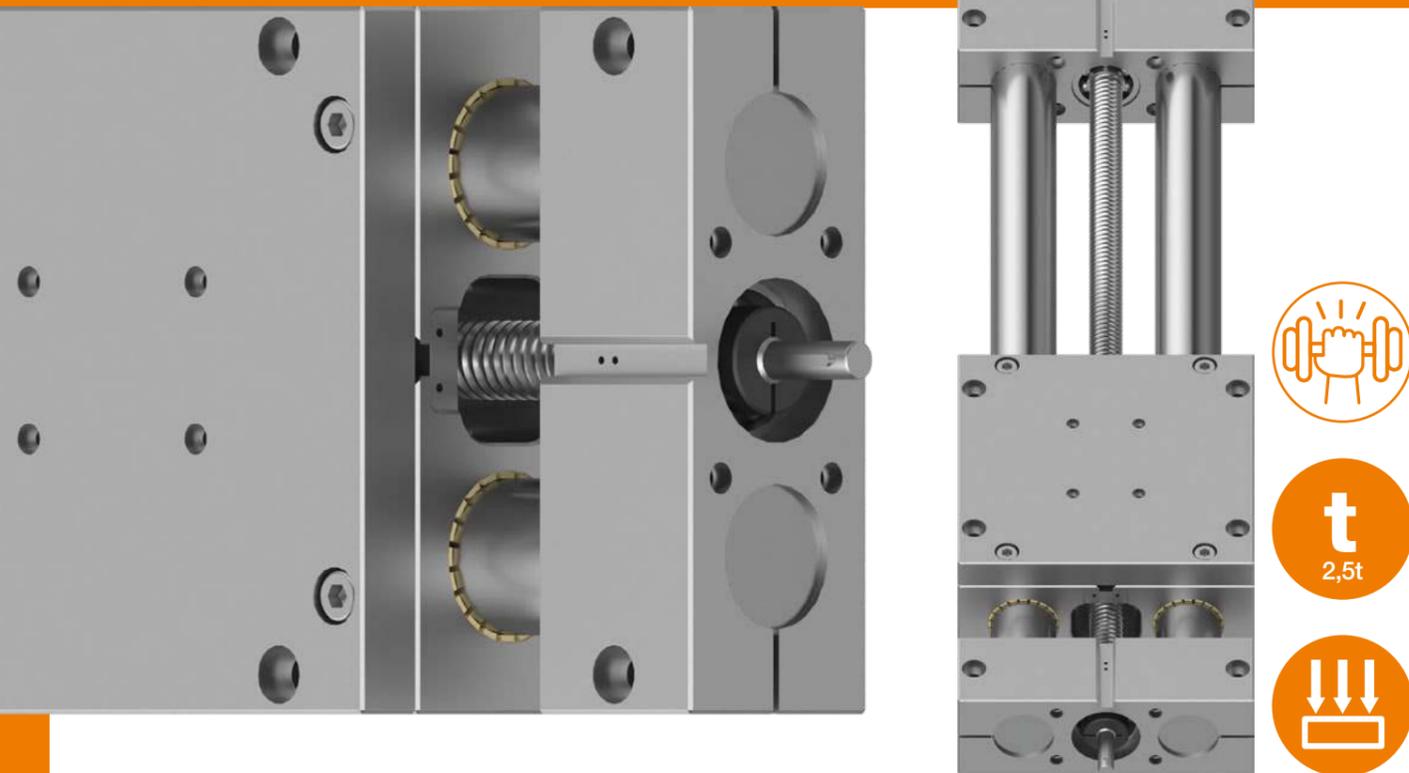
Linear module with high helix thread Ø 6.35mm

Torsion-resistant drylin® W double rails WS-06-20, robust carriage with integrated bearing liners and lead screw nut, combined with a drylin® E lead screw motor. The direct lead screw support in the stepper motor saves installation space on the motor flange and coupling.

- ▲ Available in two versions, with silver anodised components or anti-reflective black anodised components
- ▼ Supplied ready for installation and connection with a stroke length of up to 250mm
- Tested in the igus® laboratory: pitch DS6.35x2.54mm, dyn. axial force 100N, stroke length 150mm, feed 0.06m/min, speed 25rpm, 50% duty cycle, min. service life 43,967 double strokes
- 100% lubrication-free
- Configure linear modules online [igus.eu/ddx](https://igus.eu/ddx)



# Heavy-duty linear systems



**New** #heavyduty

## Three times higher ... loads ... stiffness ... dynamics

drylin® SLR – new standard for linear systems

New modular design for fast assembly and flexible constructions. Optimised design for easy installation, many combination options and space-saving accessory connection.

- ▲ Simple alignment via dowel pins, without additional bottom clamps
- ▼ Limit switches directly on the shaft end support (no additional spacers required)
- Higher rigidity with the same installation space: SLR-40 compared to SHT-30
- Optional: split lead screw nut for ease of change
- 🔗 Linear module predictable online: [igus.eu/ddx](https://igus.eu/ddx)



New series enables great flexibility with high stability

## SLR – robust lead screw axes in new larger sizes

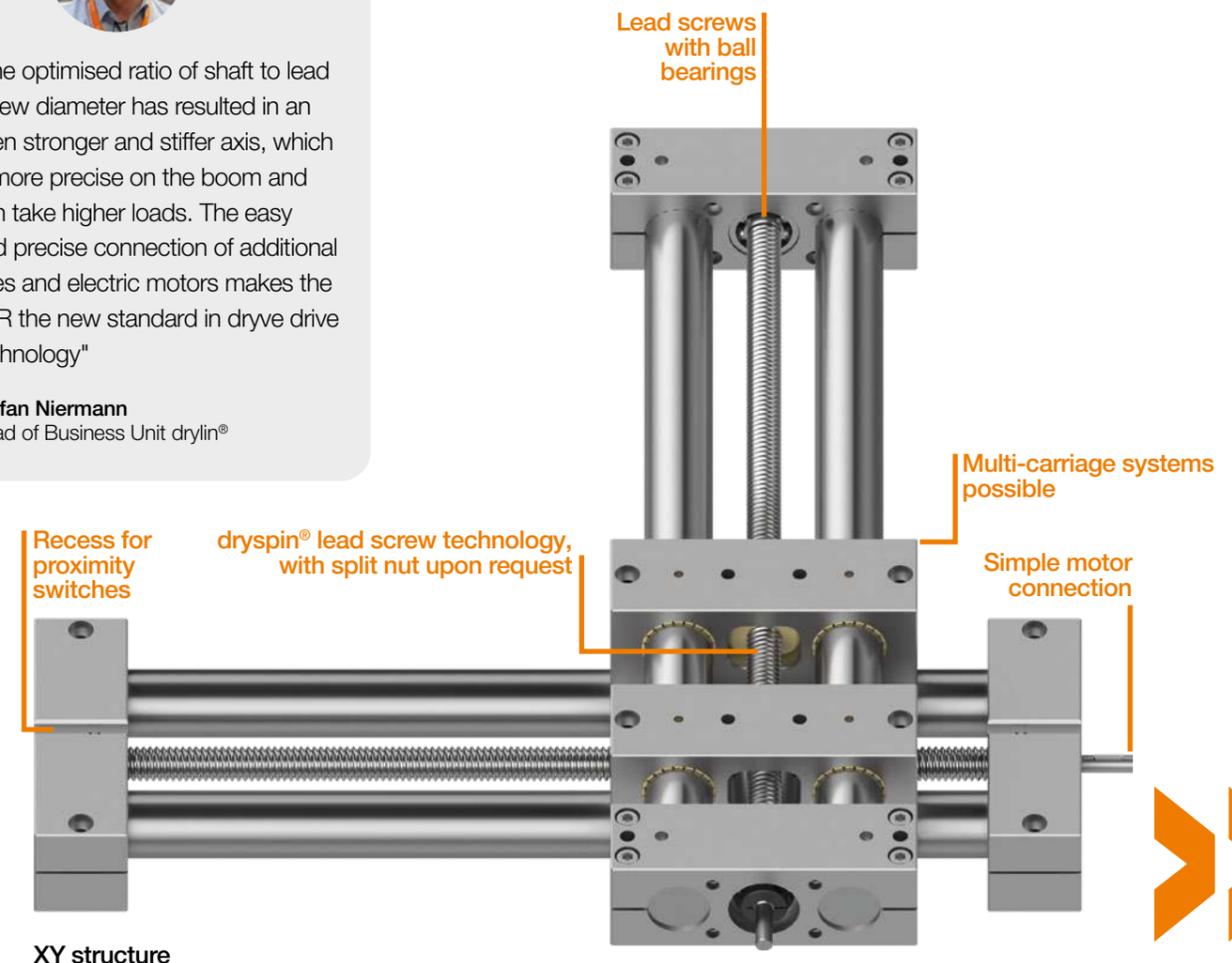
Two guide shafts, an internal lead screw as drive, shaft end supports and carriages made of aluminium have characterised the linear modules of the SHT range for many years. Customers appreciate the modularity of the configuration. And this is exactly what we want to expand in three new sizes in the new SLR line. A higher load capacity combined with a robust design that offers added rigidity. These new "heavy duty" linear modules offer a new space-saving design in combination with the smooth-running dryspin® lead screw technology. Shaft end supports and carriages offer a wide range of connection options without additional components, e.g. spacers. The carriages

also prove to be a construction miracle, which brings us back to the extended modularity of the system. This is because with the SLR, multi-carriage systems with or without opposite drive, XY and XZ configurations are possible in addition to the stand with individual carriages. The carriages also offer a technical innovation with the removable lead screw nut, which makes it possible to carry out the change without dismantling. With the larger installation sizes 40 and 50 and the installation size 60, which will be available from autumn, we are fulfilling many customer requests to develop solid, strong, absolutely lubrication-free systems for both manual and electric operation.

- Ball bearing system for high loads
- All EC/stepper gearbox combinations possible
- Limit switches directly on the shaft end support (no additional spacers required)
- Split lead screw nut for ease of change
- Carriages and shaft end supports have holders for centring sleeves (for connecting angled loads)
- Lead screw end with feather key groove for reliable torque transmission
- Higher rigidity with the same installation space: SLR-40 compared to SHT-30

"The optimised ratio of shaft to lead screw diameter has resulted in an even stronger and stiffer axis, which is more precise on the boom and can take higher loads. The easy and precise connection of additional axes and electric motors makes the SLR the new standard in dryve drive technology"

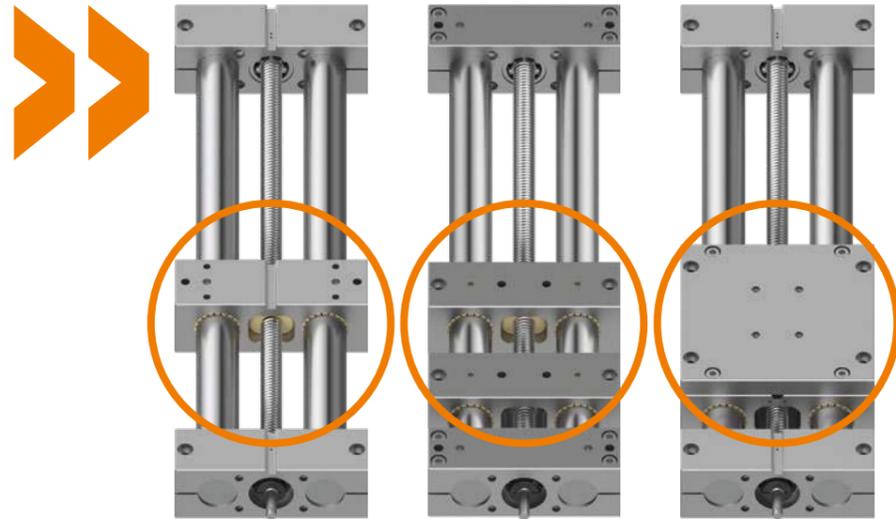
**Stefan Niermann**  
Head of Business Unit drylin®



XY structure

New series enables great flexibility with high stability

## Wide range of possible combinations



### Reduce assembly work

Instead of time-consuming assembly of accessories such as angle plates and initiator kits, XY and XZ set-ups can be implemented quickly and in a space-saving manner using dowel pins in the carriage plates and recesses for proximity switches. Customised carriage lengths can be achieved by using several shaft end supports and mounting plates.

SLR with single carriage incl. split lead screw nut for quick replacement without disassembly

SLR as a multi-carriage system with a flexibly adjustable second (or additional) carriage

SLR with a ready-to-install assembly carriage with a wide support surface

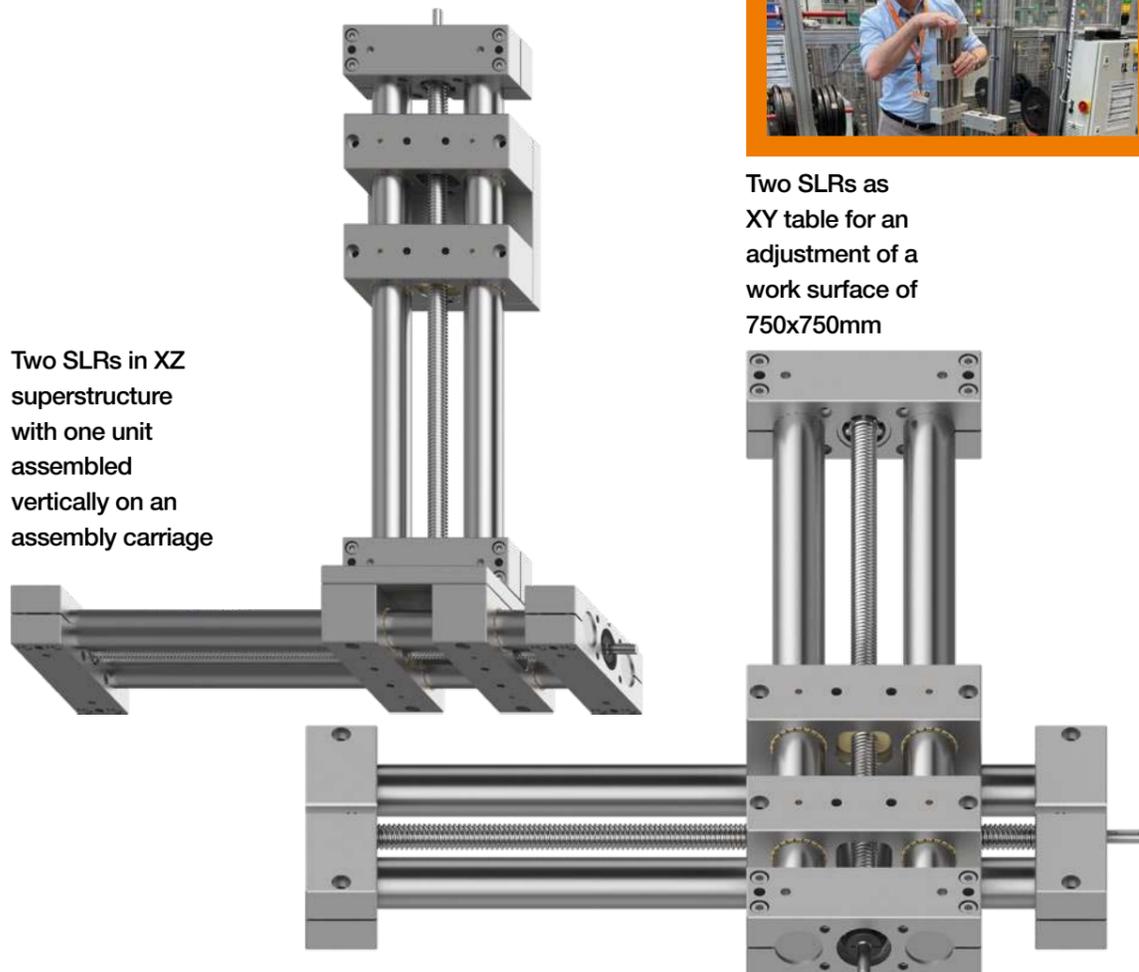
### Strong!

Max. static load capacity  
SLR-40/SLR-50/SLR-60  
Axial 2.500/4.000/6.250N  
Radial 10.000/16.000/25.000N



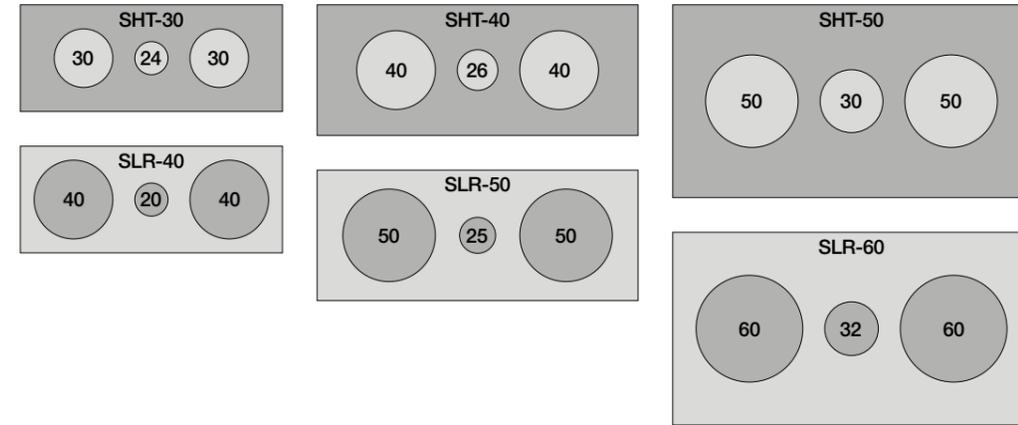
Two SLRs as XY table for an adjustment of a work surface of 750x750mm

Two SLRs in XZ superstructure with one unit assembled vertically on an assembly carriage



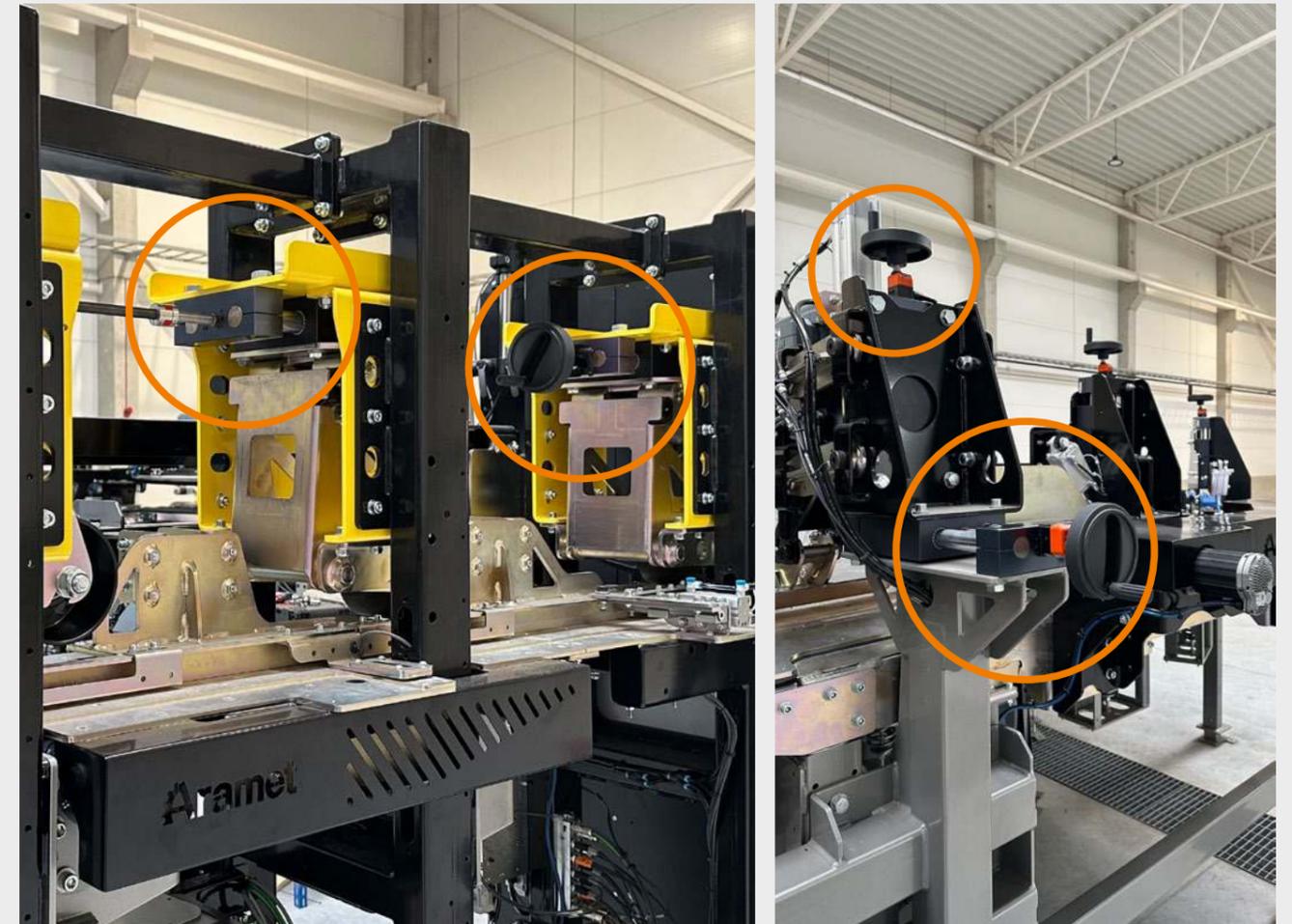
New series enables great flexibility with high stability

## System comparison SHT vs. SLR



Stronger design with the same exterior dimensions due to optimised ratio of shafts and lead screw

### Linear modules with position indicator and hand wheel



In a woodworking project, Aramet used the maintenance-free and dust-resistant drylin® linear modules from igus® to improve the technology. Aramet developed the VSS200 – Vertical Seam Sizing Line, a fully automated production line. This line picks up blocks of wood from the carousel, separates, sorts and stacks them according to quality and feeds them into the downstream wedge sinking system. A quality scanner with machine learning and artificial intelligence determines the quality of the logs based on the annual rings and screws or blows them into position depending on the findings. The system works with different log sizes and guarantees short set-up times thanks to automatic servomotors. Productivity is up to 200 strains/min (3.3 strains/s).

# New generation



**New** #assembly

## Variable mounting options, robust design

**drylin® ZLX toothed belt axis**

"As easy to connect as a machine profile" – the compact type can be easily integrated into your system with slot nuts. This is particularly useful for port superstructures.

- ▲ Higher performance thanks to larger deflection radii on the internal toothed belt
- ▼ Simple and cost-saving installation options directly on the axis
- drylin® W, installation size 16 angular, 2 rails, 4 bearings, horizontal installation position with load 150N, acceleration  $1\text{m/s}^2$ , speed  $1\text{m/s}$ , max. travel distance 25,253km
- 100% lubrication-free
- 📌 Predictable online from May 2024: [igus.eu/ddx](https://igus.eu/ddx)



### Rethinking drive technology

## ZLX – New design for long service life

drylin® toothed belt axes have been proving their worth in a wide range of applications for decades. Whether in automated system kitchens, in 3D house construction or for fast positioning of print heads. Robust drylin® W profiles with durable liners made of iglidur® J200. This year, we will be presenting the ZLX, the new generation of compact linear axes, for the first time at the Hannover Messe. In a long development process, many customer requests were collected and have significantly influenced the new design.

### New geometry according to customer requirements

The high profile was developed in a completely new geometry. A robust, corrosion-free, clear anodised profile that makes it very easy to connect to aluminium construction profiles. A large number of grooves for attaching accessories. The outer profile is characterised by a simple and robust connection of electric motors to the unit. The heart of the movement is the drylin® W linear guide system of installation size 16 integrated inside the profile. The carriage design offers variable fastening options due to grooves and slot nuts that are completely protected from external influences. In addition, the belt tension can be easily adjusted without dismantling individual components.

### Long service life thanks to iglidur®

The liners made of iglidur® J200 offer a long service life with fast and slow adjustments. In combination with a wide, coated toothed belt with a large pulley diameter, the ZLX achieves the best possible performance values. The ZLX toothed belt axis can be used in individual operation or in combination in various linear robot superstructures (XX, XXY, XXYZ).

### The advantages at a glance

- Modular, quick and easy connection of the ZLX toothed belt axis, large grooves
- Smaller grooves as a screw-on point for various accessories
- Proximity switch position can be selected via the profile length
- Grooves on the carriage for easier connection of customer parts
- Various motor and gearbox combinations are possible
- The drive can be implemented via an expanding mandrel coupling or a plug-in shaft
- Protected, internal drylin® W linear guide systems
- High resistance to sag



drylin® developer Jonas Nekum with the new ZLX toothed belt axis



## ZLX – Simple and variable installation



**1** Ready-to-install drylin® E electric motors can be easily installed on the drive shaft end support



**2** Two grooves (6mm) with 45mm groove spacing at the top, for easy connection of proximity switches and accessories



**3** Toothed belt RPP5 PU, width 20mm. PAZ coating of the gearing for improved running behaviour



**4** Carriage plate with 45mm groove spacing (groove 6mm) for easy connection



**5** Belt tension adjustment mechanism



**6** Groove (10mm) for slot nuts with thread up to M8. Roll-in slot nuts enable a flexible adaptation of the axis or attachment of accessories



**7** Available grooves: one groove (10mm) on the side, two grooves (10mm) on the underside with 40mm centre distance for simple aluminium construction profiles



**8** Internal: Linear guide drylin® WSQ 16, angular geometry with liners made of iglidur® J200. Corrosion-free profile with clear anodised surface



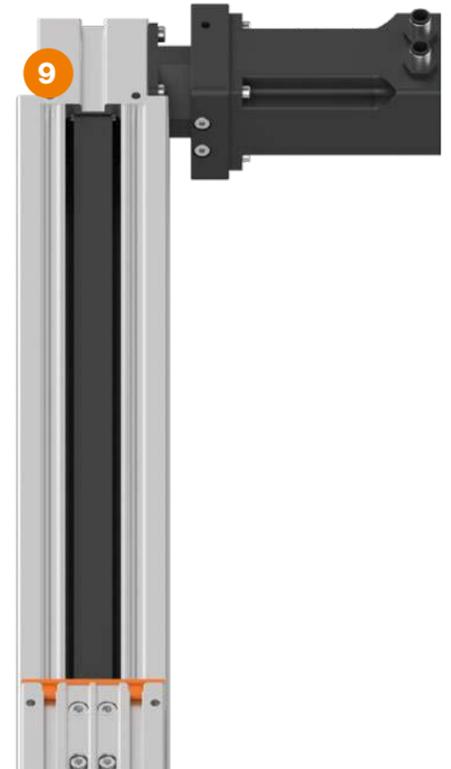
## ZLX – Ready for connection to electric motors



**9** Pulley/drive shaft end support: toothed belt disc 100mm/rev for plug-in shaft or expanding mandrel coupling and connection of motor flanges



Extensive tests in horizontal and vertical installation position in the igus® test laboratory



# GO ZERO lubrication



**238,464 hours for lubrication maintenance in bottling plants. Why? Go zero lubrication! With AI!**



# Design for washdown



Study #food

## Easy and efficient to clean

### Hygienic-design drylin® SHT linear module

Update on our design study: All components (shaft end supports/shafts/carriages) designed in accordance with the hygienic design requirements of EHEDG and DIN EN 1672-2.

- ▲ Optimised carriage design, better rinsability with customer connection. Use of high-quality, highly resistant stainless steel AISI 316Ti and AISI 304
- ▼ Quiet operation with dryspin® high helix thread
- Plastics have approvals such as FDA and EU Regulation 10/2011
- 100% maintenance-free



## Hygienic-design drylin® SHT linear module

In addition to the modular system extension with individual bearings and carriages, we have also developed our design study into a ready-to-install SHT linear module. We use drylin® R stainless steel round shafts EWMS (material AISI 316Ti) as guides and the dryspin® lead screw made of stainless steel (DS18x4) for the drive and have adapted all assemblies and parts, whether metal or plastic, to the same hygienic design specifications.

### Shaft end supports

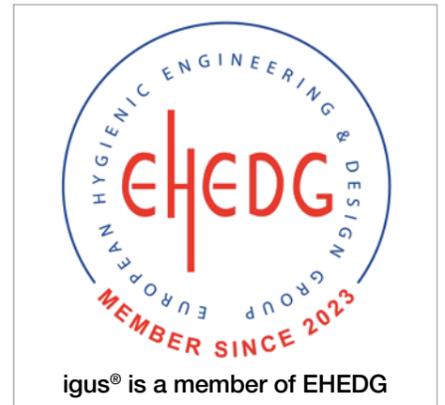
The support assembly consists of two halves. They are sealed with a flat gasket made of FDA-compliant silicone and screwed together with four hygienic screws. Two holes allow the shaft end support to be fixed to the application environment. We recommend using hygienic screws and nuts during assembly and completely sealing the holes.

### Shaft and lead screw sealing

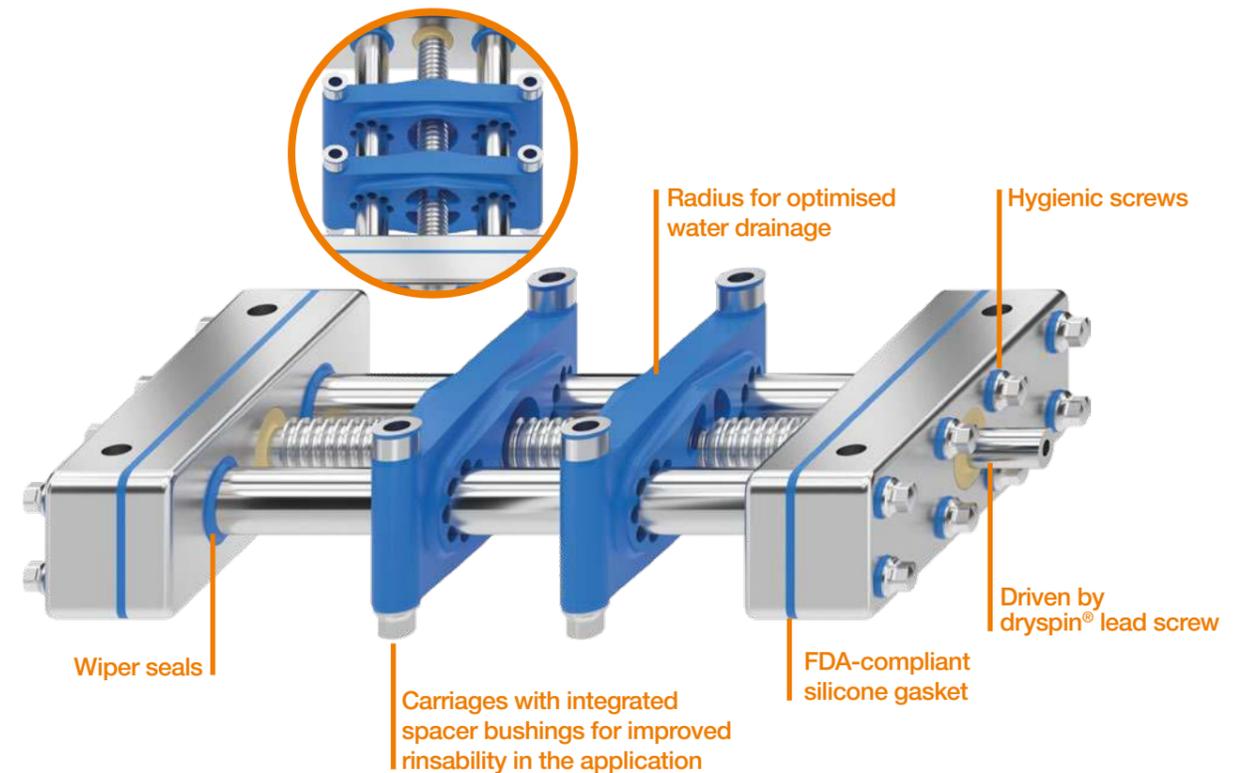
The rotating lead screw and shafts are sealed with specially configured wiper seals. The seals prevent dirt from ingressing. The gap between support unit and lead screw is large enough that no dirt can accumulate.

### Linear carriage with thread

Made from FDA-compliant igus® polymer in a patented design. Flushing grooves prevent germ formation between the thread and lead screw nut. The round shafts are optimised for effective rinsing with defined radii (min. R3). The external shape with radii and mould inclines improves drainage and ensures easy cleaning. We optimised the first version of the study with the help of hygienic screws and integrated spacer bushings for better flushability.



**Mira Heiligenhaus**  
Development Engineer drylin®



The various assemblies of the design study

# Networking with PROFINET



November 2024

## Simple integration in conjunction with Siemens control systems

### Motor control system D1 with PROFINET

The D1 motor control system for stepper DC and EC/BLDC motors is extended with the PROFINET. Due to its certified PROFINET integration, the D1 is compatible with control systems from Siemens, Beckhoff, Wago and other manufacturers. The integration time in a PROFINET network can be reduced to a minimum.

- ▲ Compatible with many automation control systems with PROFINET
- ▼ Fast integration thanks to certified D1 motor control system
- D1 compatible with PROFINET with 18% market share
- Older D1s can be upgraded to PROFINET with a free firmware update
- 🔗 Receive free firmware updates: [igus.eu/d1](https://igus.eu/d1)



### Background information on PROFINET

## D1 motor control system in the PROFINET world

### Integration of the igus® D1 motor control system with PROFINET for a seamless automation solution

In today's industrial landscape, the integration of automation technologies is crucial to improve efficiency, reliability and flexibility. The combination of the igus® D1 motor control system with PROFINET offers a powerful solution for precise and dynamic motion control system in various applications.

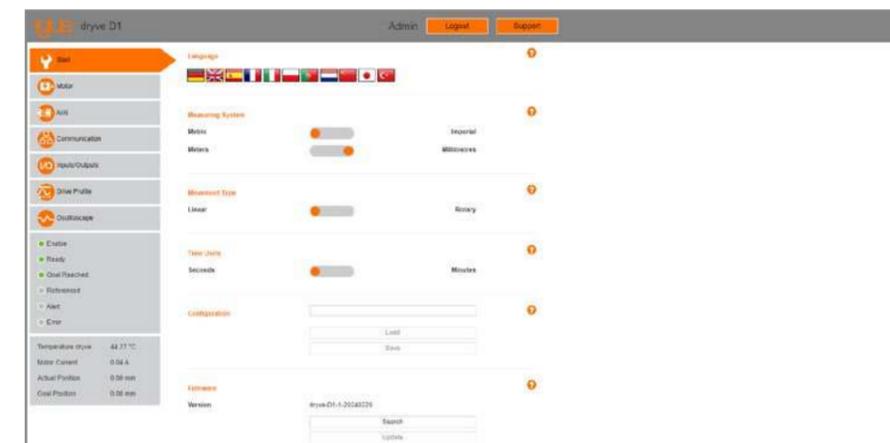
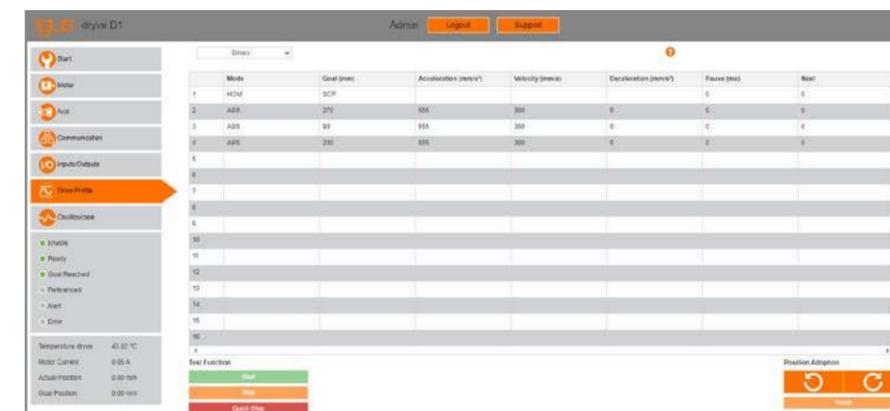
The igus® D1 motor control system offers a state-of-the-art drive solution with integrated control that is suitable for a wide range of applications, from simple positioning tasks to complex motion profiles. With its compact construction and robust design, the D1 motor control system is ideal for use in demanding environments. It can drive stepper, DC and EC/BLDC motors and, with options such as encoders and brakes, offers a universal solution for different automation solutions.

PROFINET is a widely used Industrial Ethernet communication protocol that enables fast and reliable communication between different automation components. Thanks to PROFINET integration in the igus® D1 motor control system, users can benefit from the advantages of seamless communication between drive systems and higher-level control systems.

Integration takes place via a standardised software interface that enables simple configuration and commissioning. By utilising the extensive diagnostic functions of PROFINET, users can monitor the status of the drive systems and proactively plan maintenance work.

Thanks to the flexible configuration options of PROFINET, users can seamlessly integrate the igus® D1 motor control system into their existing automation environment. This enables fast and cost-effective implementation without major changes to the existing infrastructure.

To summarise, the PROFINET integration in the igus® D1 motor control system offers a powerful solution for precise motion control in industrial applications. Seamless integration allows users to benefit from improved efficiency, reliability and flexibility advantages and strengthens their competitiveness on the market.



# Control easily



New

## Automate easily without deep knowledge

### Control units for D1

Motorised movements can be selected, started and stopped using the five control units matching the D1 motor control system. A higher-level control system or a laptop is only needed once for initialisation, but no longer required to use the application. Initial automation solutions can be implemented with control units without any prior knowledge.

- ▲ Simple operation of automation processes
- ▼ Fast commissioning thanks to interaction between D1 and control unit
- 80% time saving thanks to prefabricated control units
- Reusable and durable



### Functional description of the five control units

## Control units for "getting started with automation"

#### Precise motion control with igus® manual control systems and the D1 motor control system

In industrial environments, a precise and flexible motion control system is crucial for efficient production processes. The combination of igus® control units and the D1 motor control system offers a high-quality solution for a wide range of applications, from simple positioning tasks to complex motion profiles.

The igus® control units are characterised by their user-friendliness and ergonomic design, which enables operators to control movements intuitively and precisely. With various control unit versions such as binary, TIPP/TEACH, electronic actuator or analogue, a wide range of applications can be implemented.

#### DLE-CU-1 (binary 16 movements)

The movements previously parametrised in the D1 are called up with a 16-way rotary adjuster and controlled by means of a start or stop button. Simple movements or multiple loop movements can be realised.

#### DLE-CU-2 (Tipp/Teach 8 movements)

The movements previously parametrised in the D1 are called up with an 8-way rotary adjuster and controlled using the start or stop button. Movements and positioning can be carried out manually using JOG forwards and JOG backwards. The current position can be transferred to the D1 by manual control system.

#### DLE-CU-3 (Electronic actuator 3 movements)

A start, centre and end position can be approached using three latching buttons. The positions/speeds and accelerations are parametrised in advance in D1.

#### DLE-CU-4 (analogue high resolution)

A start and stop button can be used to start or stop an analogue movement. A speed or position is specified and executed directly by means of a potentiometer that can convert 10 revolutions. The 10-way potentiometer allows fine adjustment of the settings.

#### DLE-CU-5 (analogue economic resolution)

A start and stop button can be used to start or stop an analogue movement. A speed or position is specified and executed directly by means of a potentiometer, which can execute one revolution. The single potentiometer allows quick and rough adjustment of settings.

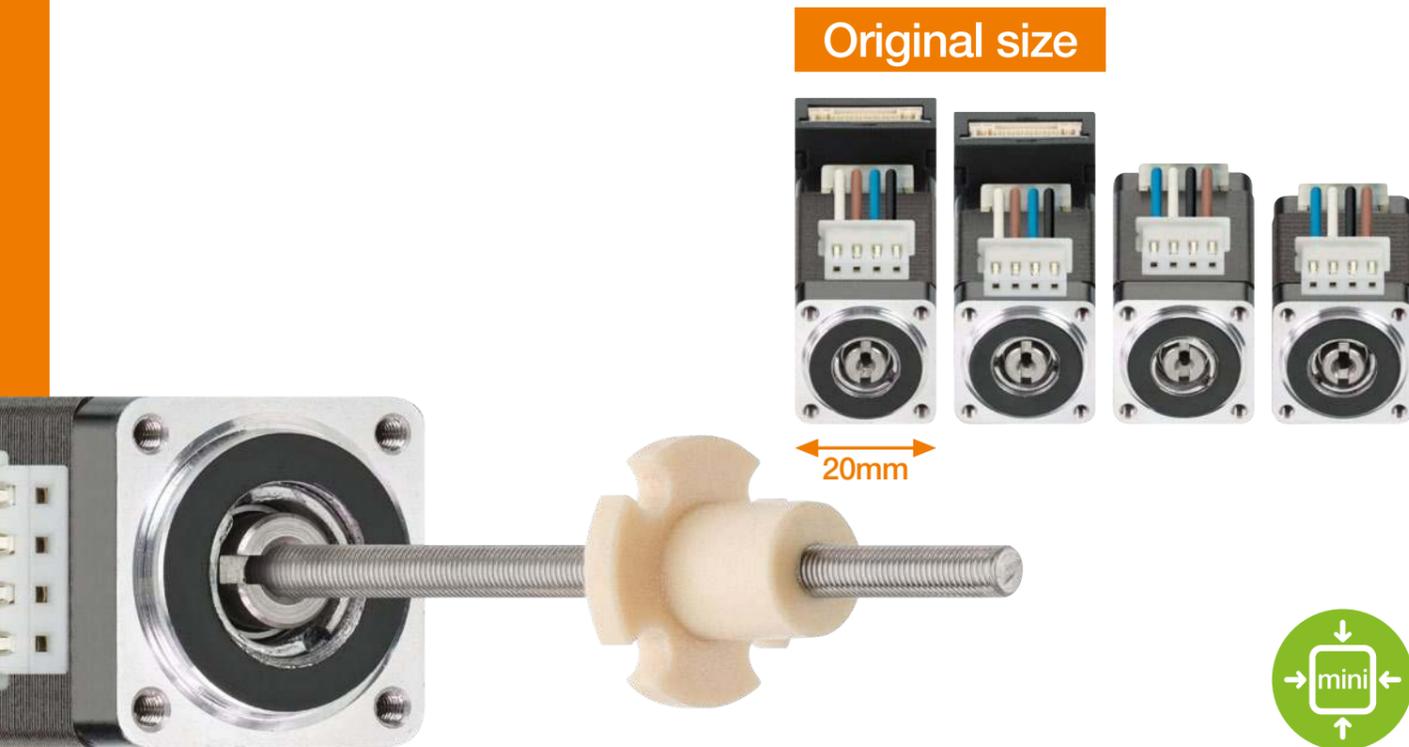
The connection between the igus® control units and the D1 motor control system is made via a standardised 8-pin M12 plug connection, which enables a quick and uncomplicated connection. By using igus® control units in conjunction with the D1 motor control system, companies can benefit from improved flexibility, productivity and efficiency in their production processes.

All in all, igus® control units in conjunction with the D1 motor control system offer a powerful solution for precise motion control in industrial applications. Due to the ease of use, reliability and flexibility of this solution, companies can strengthen their competitiveness on the market and optimise their production processes.



The movements previously parametrised in the D1 control system can be easily implemented using start and stop buttons.

# Small and strong



**New** #lab

## Lead screw stepper motors for small spaces

Lead screw motors in installation size NEMA 8

Lead screw motors of size NEMA 8 with 20mm flange dimension are equipped with a hollow shaft in which a lead screw is installed. The dryspin® DS3.5x1 lead screw impresses in conjunction with lubrication-free and maintenance-free nuts with quiet operation and extremely low drive torques. The lead screw motors are available in two lengths and with an optional encoder.

- ▲ Space-saving drive solution with a flange dimension of just 20mm
- ▼ Cost reduction for a machine due to smaller installation space and lightweight feature
- 30% installation space gain compared to NEMA 11
- CE according to ROHS
- 🔗 Find motors online: [igus.eu/dmx](https://igus.eu/dmx), configurable online with lead screw: [igus.eu/dse](https://igus.eu/dse)



# Precise and protected



**New**

## Stepper motors with encoder for humid environments

Stepper motors with encoder in IP65

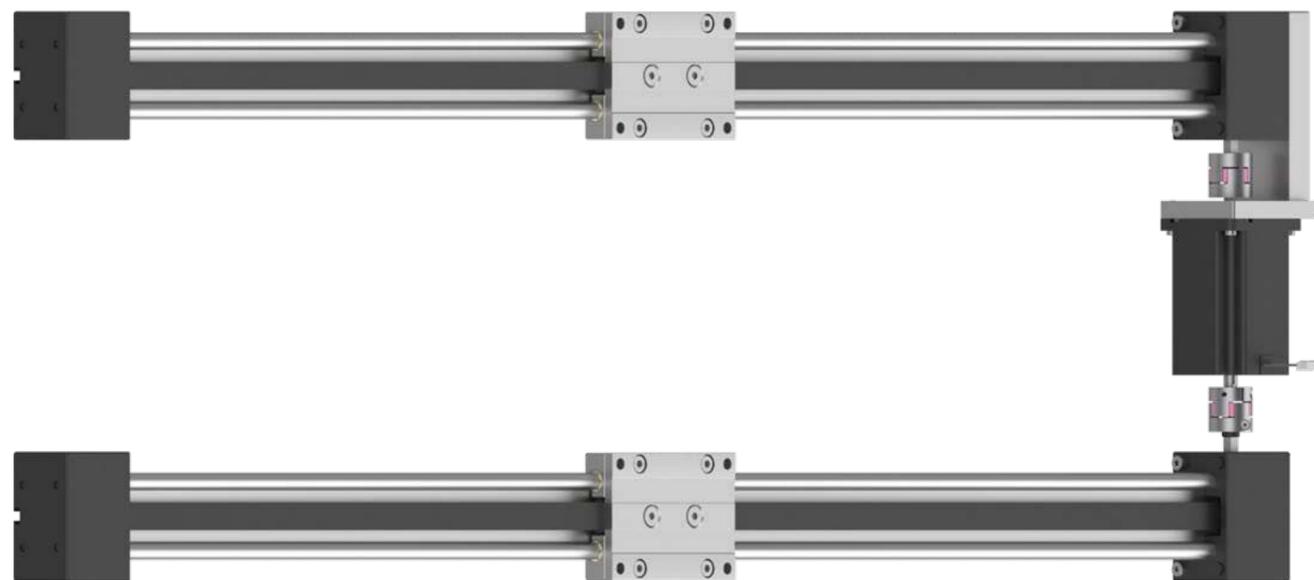
The new stepper motors in IP65 with integrated incremental encoder are designed for applications in wet areas. The series includes motors in installation sizes NEMA 17 to 34. Connection cables with a length of 1m and a terminating Molex connector are already installed on the motor.

- ▲ Stepper motor series with encoder for humid environments from 0.5 – 5.9Nm
- ▼ Directly with 1m connection cable and inexpensive Molex connectors
- 12% gain in overall length compared to NEMA 17 with metric connector
- CE according to ROHS
- 🔗 Find motors online: [igus.eu/dmx](https://igus.eu/dmx), configurable online with linear drive: [igus.eu/ddx](https://igus.eu/ddx)



Double axes with space-saving stepper motors

# Space-saving and strong



## Double axes for high torque absorption

### Double axes with space-saving stepper motors

A double axis consists of two lubrication-free and maintenance-free drylin® toothed belt axes. The motor is installed on an axis between the two toothed belt axes using a motor flange. The motor has drive pins on the front and back, which transmit the torque to the axes by means of couplings. The coupling shafts can be extended for numerous customised axis distances.

- ▲ Space-saving drive solution with high torque absorption
- ▼ Predefined double axes
- 50% installation space gain compared to externally assembled motor
- Also available with replacement bearings for a longer service life
- 🔗 Linear guide predictable online: [igus.eu/dle](https://igus.eu/dle)



Versatile applications with double axes

## Double axes for transfer and dispensing applications

### Space-saving movements with igus® toothed belt axes and double-shaft stepper motors

In applications such as product dispensers, transfer systems or closure systems, the aim is to create the largest possible passage area with the smallest possible space requirement. Furthermore, precise and reliable movements are crucial for efficient use. In regular drive systems, the motor is often located next to the drive units, which means that more space is required. Space-saving double-axis systems from igus® have the motorised drive installed in the centre, allowing the space in the machine to be used optimally. The combination of igus® toothed belt axes and double-shaft stepper motors offers an outstanding solution for a wide range of applications that need to be space-saving and powerful.

The igus® toothed belt axes are characterised by their robust design, high load capacity and precise motion guidance. Thanks to the use of lubrication-free and maintenance-free drylin® plain bearings and innovative manufacturing techniques, they offer a long service life, resulting in an excellent overall operating time.

The double-shaft stepper motors from igus® are known for their high performance, dynamics and reliability. They offer precise positioning and control of movement, making them ideal for demanding applications. With their compact design and lightweight feature, they can be easily integrated into existing systems and enable flexible design of movement sequences. The high holding torque of the motors at standstill enables a simple type of locking for safety-relevant applications.



Overall, igus® toothed belt axes in conjunction with double-shaft stepper motors offer a powerful solution for a precise motion control system in a wide variety of environments

Part No.	Axis type	Motor	Motor type	Load* [kg]
DLE-DA-0001	ZLW-0630-02-B-60	MOT-AN-S-060-005-042-L-A-AAAB	NEMA17	2
DLE-DA-0002	ZLW-0630-02-S-100	MOT-AN-S-060-020-056-L-A-AAAB	NEMA23	5
DLE-DA-0003	ZLW-1040-02-B-100	MOT-AN-S-060-035-060-L-A-AAAB	NEMA24	7
DLE-DA-0004	ZLW-1040-02-S-100	MOT-AN-S-060-059-086-L-A-AAAB	NEMA34	10

\* The load specifications serve as a rough classification. They refer to horizontal applications with central load centres and ED 10%. Precise designs can be carried out with igus® online tools.  
Online: [igus.eu/dle](https://igus.eu/dle)

GO ZERO risk ... lubrication-free & cost-effective automation

# Low Cost Automation



Tech up



Cost down



Proof



Sustainability



Digital

## 240

**Mobile robots for various applications**  
In the fast lane

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**ReBeL® on wheels**  
Pick-up and delivery service

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**igus® Robot Control Vision app**  
Pick me, please!

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**SpeedLine linear robots**  
Bigger, stronger and faster

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**20 ready-made solutions under €15,000**  
Automation classics as plug to program

## Blog topics

**#lab, page 19**  
motion plastics® for cleanrooms and laboratories  
**#assembly, page 24**  
motion plastics® for easy assembly



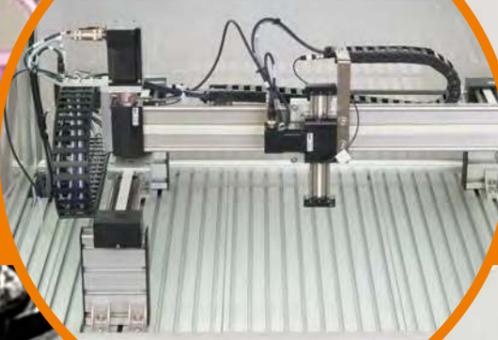
## Online tool

**Configure linear robots**  
[igus.eu/linear-robot-configurator](https://igus.eu/linear-robot-configurator)



## Battery cell handling

We have developed a complete cell for handling rechargeable batteries for this customer.



## Catalogue

Available soon: Find out everything you need to know about Low Cost Automation. With many application examples and additional information. MAT0075660.20

# [igus.eu/news-LCA](https://igus.eu/news-LCA)

# In the fast lane



**New**

## High-tech at a low price

### Mobile robots for various applications

An automated guided vehicle with lightweight robot. Now at a low-cost price!

- ▲ Programming freedom: ROS, Java, Unity, Python
- ▼ Up to five times more cost-effective than classic mobile robot solutions
- Already in active use in the office and production of igus®
- Unnecessary transport routes are eliminated



### ReBeL® on Wheels: Mobile robot

## A lighthouse project on wheels

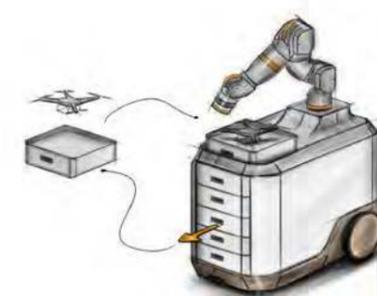
Combining automated guided vehicles with a cobot is nothing new. To date, however, these systems have not been affordable for medium-sized companies. Models available on the market start at around €25,000. Solutions with an integrated robot arm start at €70,000. It is difficult to achieve widespread use in the market. This is where Low Cost Automation comes in to change this.

For four years now, igus® has been putting AGVs through their paces in-house. For example, driverless shelves that deliver mail and other deliveries to offices. Or around 30 mobile robots that are on the move in production to bring fast transports or rotary stacking containers to your warehouses. The lessons learnt are then incorporated into the development of the igus® robots.



The definition for the lighthouse project is: a mobile robot with integrated HMI and vision that could even tidy up an office on its own. The roadmap envisages that different systems will emerge along the way. This year, igus® is launching with a slimmed-down version for the education sector, which will be priced at less than €10,000 – including the robot arm!

How is such a cost-effective price possible? The development approach pursues a bottom-to-top strategy: components such as classic safety laser scanners are not included in the basic package. Because these components would go beyond the price range. Nevertheless, it is ensured that the solution can be easily retrofitted for industrial requirements. For example, all VDA5050 specifications are largely observed.



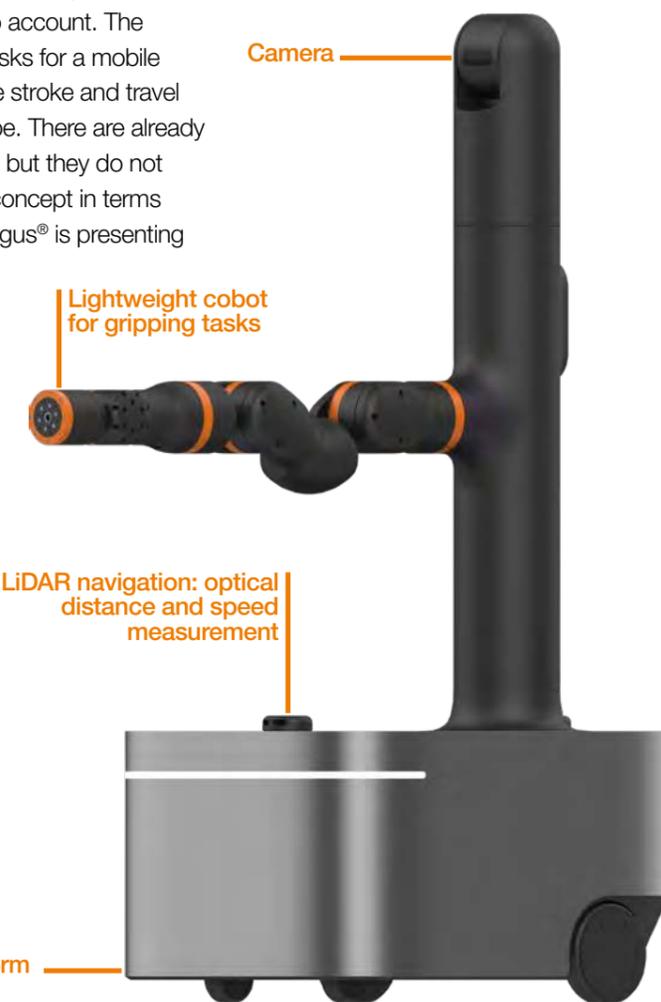
There are other technical aspects that the project takes into account. The wider the range of tasks for a mobile robot, the greater the stroke and travel of the gripper must be. There are already solutions for this too, but they do not fit into the low-cost concept in terms of price. That's why igus® is presenting

an affordable gripper this year that has a large stroke and long travel and great flexibility when gripping different geometries.

The vision behind all these development efforts goes beyond simple but effective applications, such as transporting components from A to B. Cleaning tasks or serving coffee directly at the workplace show that applications can be found in all areas of life.



**Alexander Mühlens**  
Head of the Low Cost Automation Business Unit



# Pick-up and delivery service



## New

### Open source mobile robot for the education sector

#### ReBeL® on wheels

The mobile robot for educational institutions is an open source and autonomous learning platform with integrated ReBeL® cobot arm and gripper.

- ▲ A control system for the robot arm and gripper and the platform
- ▼ Modular design that can be expanded to include additional functions, e.g. Lidar, camera technology, slam algorithm
- Live test in our customer test centre in Cologne
- Manufactured and developed in Germany
- 🔗 Free control software [igus.eu/irc](https://igus.eu/irc)



## Study

### Service robotics at a low price

#### ReBeL® Butler

This mobile robot is suitable for simple but time-consuming pick-up and delivery services, for example in the hotel and catering industry.

- ▲ Pick-up and delivery services at table height, transport up to 2kg
- ▼ Staff can devote themselves to more valuable tasks
- Tested in the in-house customer test centre in Cologne
- Can be retrofitted with additional components
- 🔗 Remotely controllable [igus.eu/irc](https://igus.eu/irc)



## New

### Mobile robotics for light tasks

#### Mobile robots for small and medium-sized enterprises

With the automated guided vehicle system, with optional manipulator / ReBeL® cobot, simple A to B positioning can be carried out.

- ▲ Combination of robot and AGV, transport up to 30kg
- ▼ No need for expensive sensors, 3D sensor technology developed in-house
- Based on DIN EN ISO 3961
- Platform can also be retrofitted with cobot
- 🔗 Remotely controllable [igus.eu/irc](https://igus.eu/irc)



# Powerful



€4,970

Update #lab

## Test passed: cleanroom, noise emission, load, low consumption

### ReBeL® in the test

We have tested the ReBeL®: noise level, cleanroom class, energy management and load capacity.

- ▲ Precise figures on performance parameters simplify decisions on deployment scenarios
- ▼ No more in-house tests necessary, as they have already been extensively tested for various applications
- Continuous sound level of 58.2dB(A), cleanroom class 4 and 2kg payload at 500mm reach
- Low-noise operation and low cleanroom class protect people's health



ISO Cleanroom Class 4



max. 58,2dBA



2.5kg max. load



Tested by the Institute for Occupational Safety



40W average consumption



### The ReBeL® in the test

## Testing for all it's worth

Cell after cell is lined up close together. The sounds of robots and gearboxes in motion cannot be ignored. Individual employees move between the test rigs, take notes and prepare new tests. The atmosphere is concentrated.

A warm welcome! They are located in the igus® internal Low Cost Automation test laboratory. Robots and gearboxes are put through their paces here over an area of 200 square metres. Only one door separates the Customer Test Area from the laboratory specialising in automation solutions. Practical customer tests and intensive product tests literally go hand in hand.

The robot has been a regular guest here since the development of the ReBeL® cobot began. The following tests have been the focus of attention in recent months: noise emissions, cleanroom, maximum load and energy consumption.

### Noise emission

Based on the VDI guideline 2058 "Assessment of noise at the workplace taking into account different activities", the aim was to analyse the noise emission with different test parameters such as speed and load. The equivalent continuous sound level was determined for the individual parameters in accordance with DIN 45 641. (see diagram 1)

**Result:** The equivalent continuous sound level of the ReBeL® with six degrees of freedom is 58.2dB(A), which

corresponds to the noise emission of a conversation. The ReBeL® is therefore quieter than lightweight robots from other manufacturers!

### Cleanroom

The test to determine the cleanroom class is based on DIN EN ISO 14644-1 and DIN EN ISO 14644-14. igus® designed the cleanroom in collaboration with the Fraunhofer IPA. This complies with the required standards. Particle emissions were measured using a realistic "pick-and-place" customer application. The measuring point was below the output of the third axis. (see Diagram 2)

**Result:** The ReBeL® was tested under various loads and speeds, but these had no influence on the classification: ISO cleanroom class 4 out of 9 was always achieved. This means that the robot is often also suitable for areas where high standards apply, such as food handling or laboratory applications.

### Load

According to VDI 2861-2, the maximum load characterises the upper limit of the load and/or force that can still be handled under restrictive conditions [...]. A ReBeL® with six axes was used. In order to obtain comparable test results to the ReBeL® with four axes, the laboratory staff set the nominal reach to 200 and 500mm with loads of 0.5 to 3.5kg.

**Result:** Based on the test results, the following maximum loads result for the ReBeL®: (see Diagram 3)

Nominal reach [mm]	Maximum load [kg]
200	3.5
500	2.5

### Movement

Axis	Negative	Positive
Axis 1	-179°	up to +179°
Axis 2	-80°	up to +140°
Axis 3	-80°	up to +140°
Axis 4	-179°	up to +179°
Axis 5	-95°	up to +95°
Axis 6	-179°	up to +179°

The results of the test also show that the maximum load is particularly dependent on the type of application. With pick-and-place applications, significantly higher loads can be moved compared to "worst-case applications" in which many axes are moved.

### Energy consumption

The power consumption with a load of 2kg was tested according to the Pick definition (7 pick/min). The average consumption is 40W. The maximum consumption of the robot is 200W.

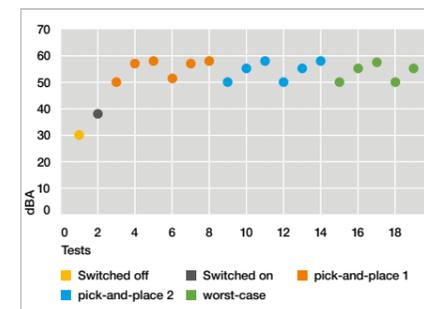


Diagram 1: Equivalent continuous sound level – tests 1-19

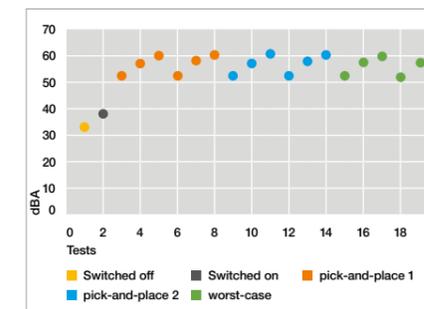


Diagram 2: Maximum sound level – tests 1-19

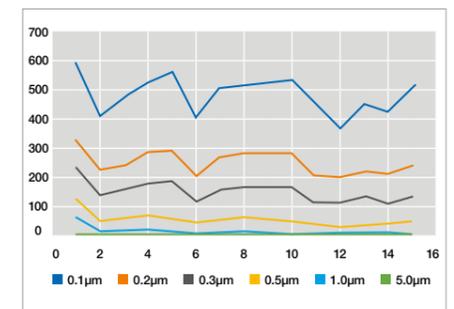


Diagram 2: 2kg – 80% speed – 10s pause

# Simply grab it



New #assembly

## Gripper bundles

ReBeL® Environment

Install or change grippers on the ReBeL® easily – with the gripper bundles for the igus® ReBeL®.

- ▲ Flexible and easy to change, with assembly instructions
- ▼ Quick and uncomplicated installation
- All bundles were tested in the Low Cost Automation laboratory
- Durable, robust materials



New #assembly

## Go for it!

ReBeL® Environment

The first gripper in the ReBeL® design! With a gripping range of 100mm, components of different sizes can be handled very easily with just one gripper. Ideal for the training sector.

- ▲ Suited for use on the ReBeL® due to its lightweight construction
- ▼ Due to the large gripping range, only 1 gripper is required for different applications
- Flexible gripping range with parallel design
- One gripper for many components



# As simple as in a furniture store

Plan your machine around the ReBeL® online

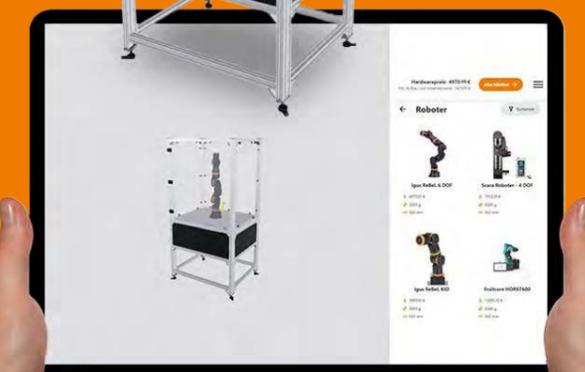
- CE-compliant machine planning
- Directly in the browser, without an expensive CAD tool
- Transparent price display



Free CAD download



[igus.eu/machine-planner](https://igus.eu/machine-planner)





**New**

## Easily recognised

**ReBeL® Environment**

Handle objects easily with the camera bundle for the ReBeL® and ifm cameras in the igus® Robot Control.

- ▲ Large variety of components
- ▼ Simple integration with common interface
- Use in in-house factory automation
- No holders or blister packs required for the components



**New**

## Everything at one table

**ReBeL® Environment**

The flexible workstation for planning, programming and your application for self-assembly.



- ▲ Strong aluminium profile table with worktop
- ▼ Workstation customised for your application, everything from a single source
- Used for in-house training and internal automation applications
- Mobile with rollers and can be used in different locations



**Study**

## Cost-effective AI camera set

**ReBeL® Environment**

Intelligent component recognition with a low-cost camera and image processing via a neural network. Just 30–50 images for teaching are enough to recognise everything from pralines to the circuit board.

- ▲ AI-supported component recognition for better results
- ▼ No expensive high-end camera necessary
- Tested in the igus® Low Cost Automation lab
- Simple teach-in of new components



**New**

## Sample programs and integration

**ReBeL® Environment**

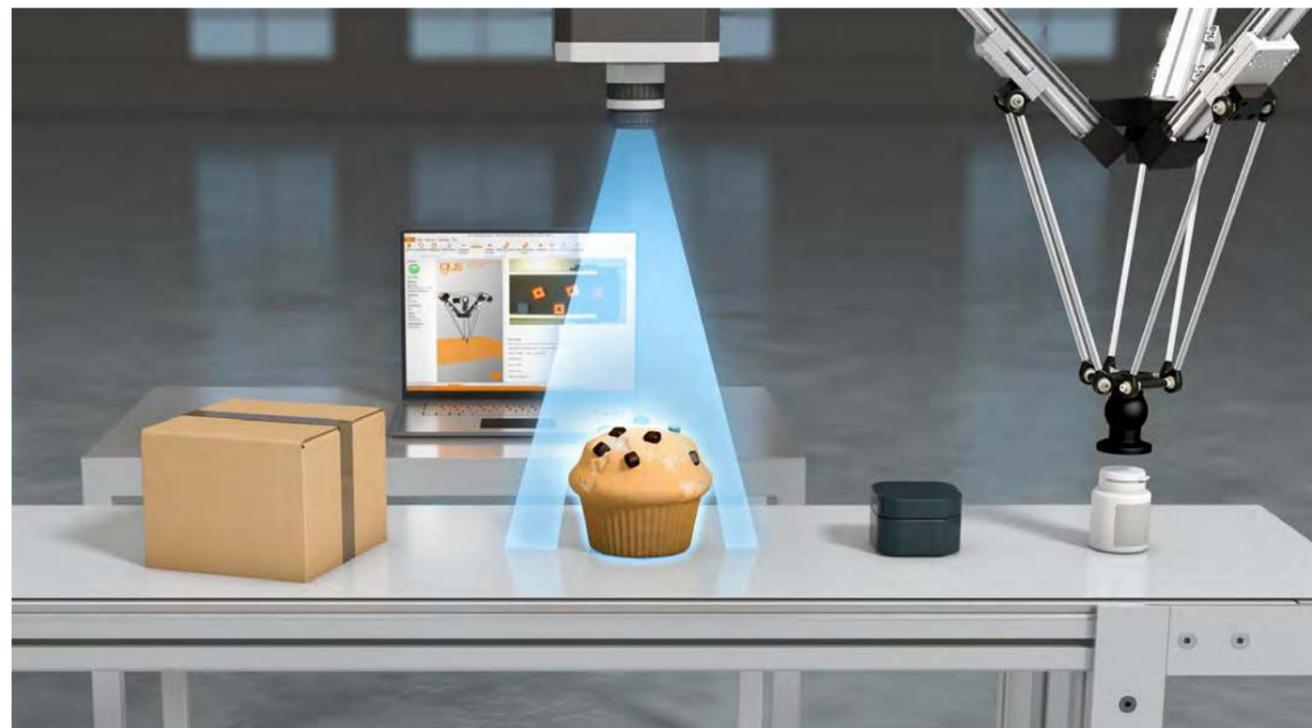
The integration of the ReBeL® is made even easier by sample programs for TwinCAT and ROS and the integration into Gazebo.



- ▲ New sample programs for Gazebo, TwinCAT and ROS and implementation with .urdf files
- ▼ Reduce time and costs with easy integration
- Tested in the Low Cost Automation laboratory and in use by customers
- Saves development costs



# Pick me, please!



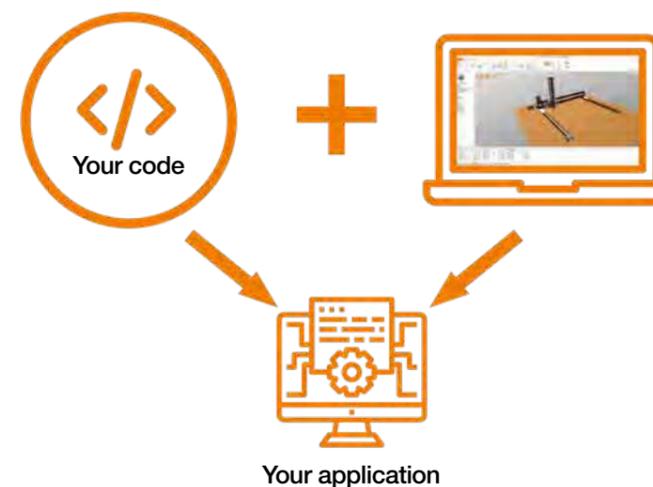
**New**

## Simple integration for your camera application

### igus® Robot Control Vision app

With its intuitive user interface, the igus® Robot Control Vision app offers a simple setup of a wide range of end-of-line tasks – regardless of whether you need to grip round, square or rectangular contours.

- ▲ Uncomplicated and cost-effective integration, 5 minutes per component
- ▼ Connection of cost-effective USB cameras from various manufacturers possible
- Graphical configuration directly in the igus® Robot Control software, as well as use in in-house factory automation
- Continuous further development of new functions
- 🎀 User-friendly and licence-free software simplifies robot programming [igus.eu/irc](https://igus.eu/irc)



**New**

## Interface for your extensions

### igus® Robot Control App Connect

The new interface supports you in writing your own solution, e.g. specialised movement algorithms, interfaces to external devices or software. You can write your own solution using Python or C++.

- ▲ The functionality of your robot is extended by additional functions and applications
- ▼ Reduction of additional hardware and systems through direct software integration
- Use in in-house factory automation
- Regular updates and new functions
- 🎀 User-friendly and licence-free software simplifies robot programming [igus.eu/irc](https://igus.eu/irc)

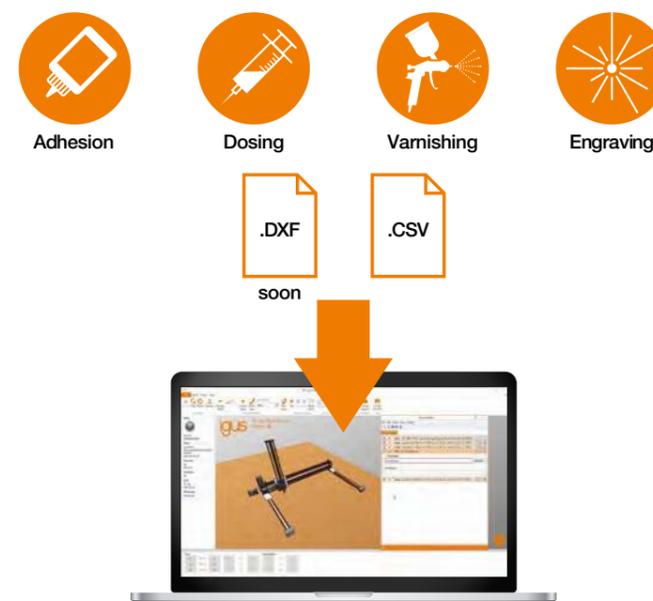


**New**

## Import files via drag & drop

### igus® Robot Control converter

The igus® Robot Control converter enables users to transfer their programmed coordinates from a CSV, SVG and DXF file directly into robot coordinates. This interface is particularly suitable for gluing and dosing applications.



- ▲ No manual programming of the travel for component contours
- ▼ Fast import of CSV, SVG and DXF files into a robot program
- CSV converter is used in igus® in-house production
- One software for all igus® robots
- 🎀 User-friendly and licence-free software simplifies robot programming [igus.eu/irc](https://igus.eu/irc)



# Simple robot control

Download the free no license control software.

- Test all igus® kinematics in the software in advance
- With pre-programmed projects for all igus® robots, single axes and mobile robots
- Intuitive 3D interface with simulation of the robot, gripper, cameras and much more

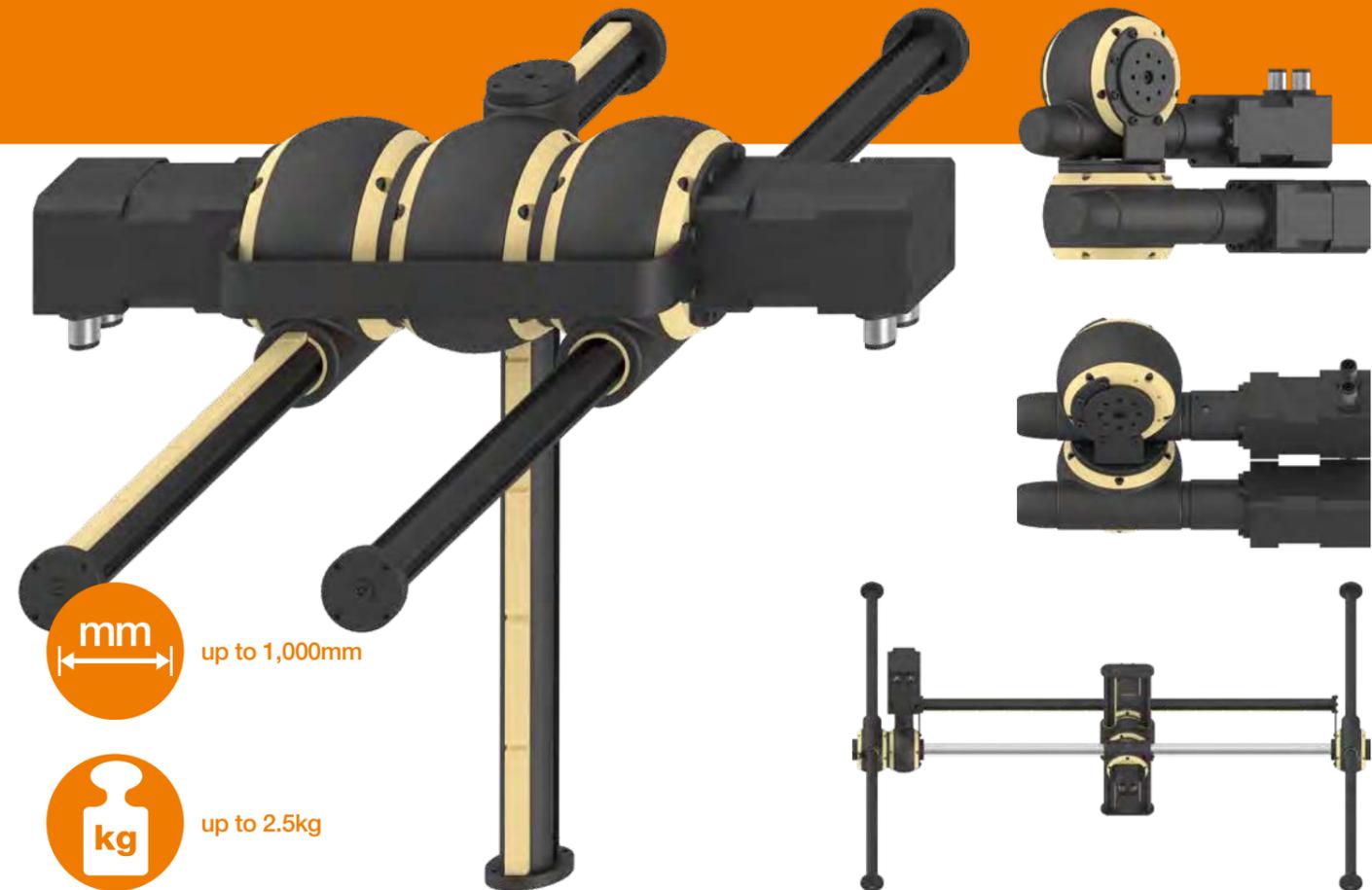


[igus.eu/robot-software](https://igus.eu/robot-software)



Modular robotics, endless possibilities

# Build your robot



**mm** up to 1,000mm

**kg** up to 2.5kg

**New**

## No frills: simple control

igus® Joint Control

The igus® Joint Control is the perfect control system for simple tasks. It is quickly programmed via a web server interface and is therefore ideal for use in simple applications such as vending machines. Ideal for your modular robotics project without inverse kinematics.

- ▲ Compact and easy to program for simple applications
- ▼ Cost-effective integration in existing switch cabinet
- Tested in the Low Cost Automation laboratory in Cologne
- The robot control system can be expanded with additional motor modules
- 🎯 Intuitive user interface for smart phone and desktop



**New**

## Modular, flexible and easy to configure

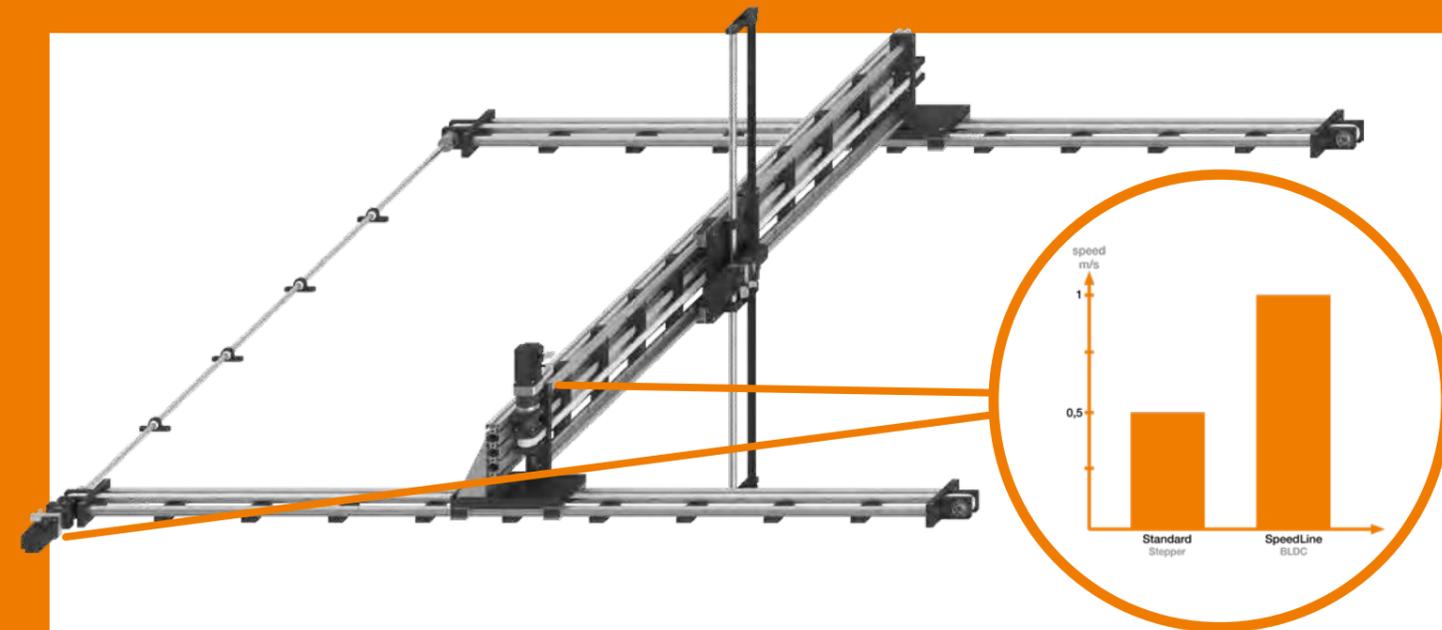
Modular robotics, endless possibilities

Combine your robot from Apero® gearboxes exactly as you need it or use the pre-constructed Apero® robot systems in our shop.

- ▲ Countless combinations and individual kinematics can be implemented
- ▼ Simple assembly thanks to high modularity
- Application examples online
- Lubrication-free
- 🎯 Configure modular robots in the Apero® configurator [igus.eu/apiro-configurator](https://igus.eu/apiro-configurator)



# Bigger, stronger and faster



- 6,000mm
- 2x faster
- 10kg

**New** #heavyduty

## The new series of linear robots

### SpeedLine linear robots

Higher speeds and more dynamic processes in one. igus® linear robots driven by a new motor technology enable shorter production times as well as increased throughput rates, which leads to an increase in productivity and a reduction in production costs.

- ▲ Higher speeds and more dynamic with new combination of linear axes and motor technology
- ▼ Cost-effective alternative to servo motors
- Tested in the igus® laboratory for up to 10,000,000 cycles
- 100% lubrication-free through the use of igus® high-performance polymers in all bearing points
- 🎮 Simulate the movement in the free and licence-free iRC software [igus.eu/robot-software](https://igus.eu/robot-software)



**Update**

## Faster, further, stronger

### SCARA robot

The new SCARA robot is even faster and has an even greater range. This makes classic applications such as pick-and-place, conveyor belt picking and loading processes even more efficient.

- ▲ Faster pick rate of 20 picks/minute and greater reach of 600mm
- ▼ Reduced integration effort
- Long-term and load tests in the Low Cost Automation laboratory in Cologne
- Lubrication-free operation
- 🎮 Test SCARA in advance with the igus® Robot Control [igus.eu/irc](https://igus.eu/irc)



**Study**

## Bigger, faster, further

### Study: Delta robot – DR1000

The new low-cost delta robot DR1000 with an impressive reach of 1,000mm and an incredible pick rate of 75 picks/minute sets new standards for cost-effective automation. The combination of precision and speed makes this robot ideal for end-of-line applications.



- ▲ Even greater range and fast pick rate for the delta robot segment
- ▼ The higher speed means that production times can be shortened and throughput rates increased
- Study: currently being tested in the Low Cost Automation laboratory
- Long reach, the delta robot can take on the tasks of several robots



# Automate out of the box



- Palletising 
- Adhesion 
- Quality assurance 
- Fixings 

**New**

## 20 ready-made solutions under €15,000

Automation classics as plug to program

From dosing, drilling, screwing and palletising up to quality inspection – from now on you can receive classic automation applications as a ready-made solution for self-assembly or with an assembly service.

- ▲ CE-compliant machine systems for immediate "plug to program" use
- ▼ Simple but highly functional low-cost solutions under €15,000
- All ready-made solutions were extensively tested in the Customer Test area in Cologne
- Only buy exactly the components that are required for the solution
- 🔗 Machine planner: Test a complete machine system online with your own component [configurator.rbt.com/en/en/machine-planner](https://configurator.rbt.com/en/en/machine-planner)



# Bootcamp for robot skills



**New**

## igus® robot training

Beginner to expert training

As part of the training, you will have the opportunity to acquire basic programming skills and in-depth knowledge of an igus® robot. Under the guidance of our trainers, you will learn in realistically equipped training cells. In our training course, you will program the robot several times and implement common applications with the integration of conveyor belts, sensors and grippers. You are welcome to bring your application with you.

- ▲ Learn how to get the most out of igus® robots to maximise performance
- ▼ Discover efficient working methods and automation techniques that help to reduce your operating costs and increase profitability
- After successfully completing the training, you will receive an igus® automation certificate
- Knowledge learnt can be passed on





GO ZERO risk ... Automate your factory from €2,000

# RBTX®

 **RBTX**  
by igus®

-   
Tech up
-   
Cost down
-   
Proof
-   
Sustainability
-   
Digital

**260** Plan directly in digital arena  
Machine planner

**262** Over 500 solutions under €12,000  
Five years RBTX® by igus® –  
the Robotix marketplace

**263** App-World – Software for every application  
Welcome to the future of automation!

**263** Automate like a pro  
Your application takes centre stage

**264** Inexpensive spiral conveyors  
RBTX® Basics bowl feeder

## Blog topics

#assembly, page 24  
motion plastics® for easy assembly



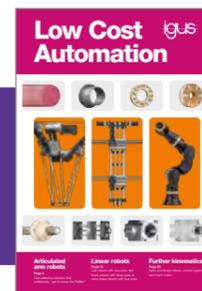
## Online tool

Machine planner  
[configurator.rbtix.com/mp](http://configurator.rbtix.com/mp)



## Reliable quality control

ReBeL® cobot checks circuit board quality

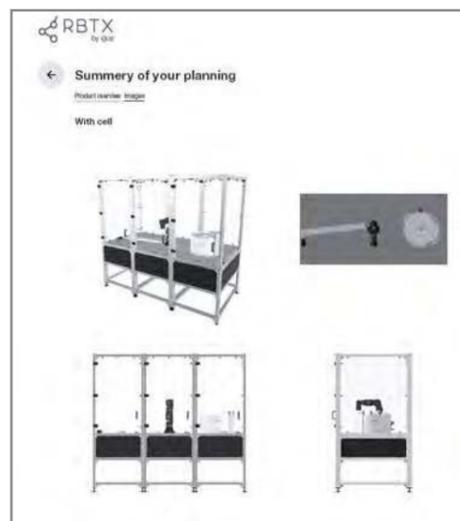
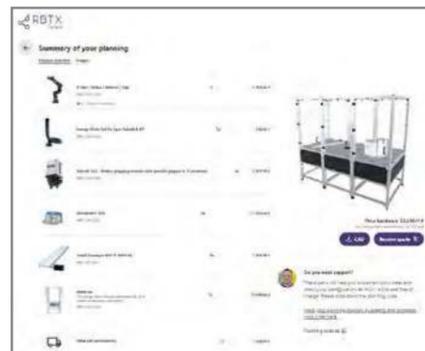
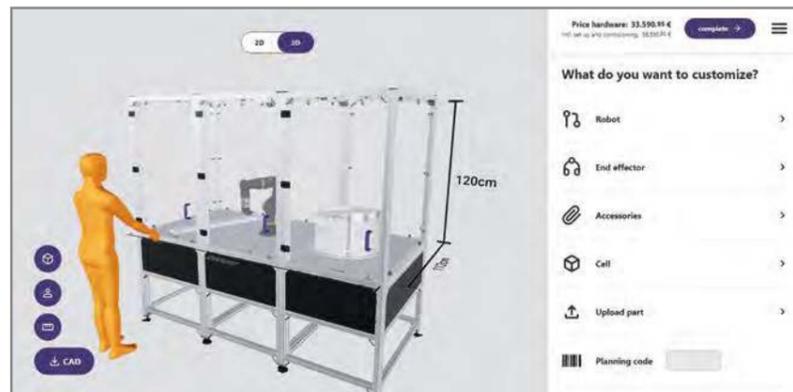


## Catalogue

Available soon: find out everything you need to know about RBTX® and Low Cost Automation. With many application examples and additional information. MAT0075660.20

# igus.eu/news-LCA

# As simple as in a furniture store



3D planner with free CAD download and direct fixed price offer

## Machine Planner: Robot solution planned in five minutes

With the Machine Planner, you can develop your robot solution yourself. The free 3D planner allows you to quickly test your automation ideas and requirements and order them directly.

Your plans are as individual as your applications. And you can be sure that

- The safety of your solution is CE-compliant.
- You always have a transparent overview of the low-cost price.
- You can always book commissioning as an option.

### Suitable for every application

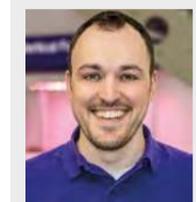
From dispensing, drilling, pick-and-place and palletising to quality inspection – the 3D planner is so flexible that you can use it to design almost any application.

### Design library as a guide

The RBTX® platform, on which the Machine Planner is offered, also provides a design library as an orientation aid. Various machine substructures await you there – from a simple work table to a lifting column to a fully enclosed safety cell – because your robot needs the right infrastructure to realise its potential. These substructures can then be customised to your individual requirements in the Machine Planner.

### Component upload and CAD download

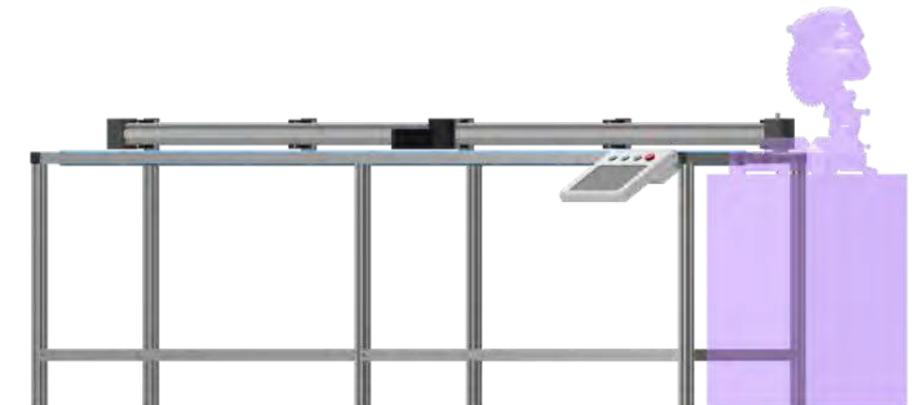
Use the configurator to digitally test your robot solution before use. You can upload your component and then download the CAD data in STEP format with assembly instructions. Your customised planning can also be called up again at any time using your individual planning code.



Jens Klärner  
Product Owner Online Platforms  
Low Cost Robotix [rbtx.com](http://rbtx.com)



**The promise:** as easy as planning a wardrobe in a furniture store. A complete machine can be created without any CAD or design knowledge – simply in a web browser and without the hassle of installing a program. The configurator allows you to select robots and accessories such as grippers and feed systems. Doors and rear panels of the safety cell, or a substructure of your choice, can be individually and effortlessly installed or converted with just a few clicks. Your solution is ready for use within five minutes without CAD drawings or technical clarifications.



New #assembly

## Plan directly in digital arena

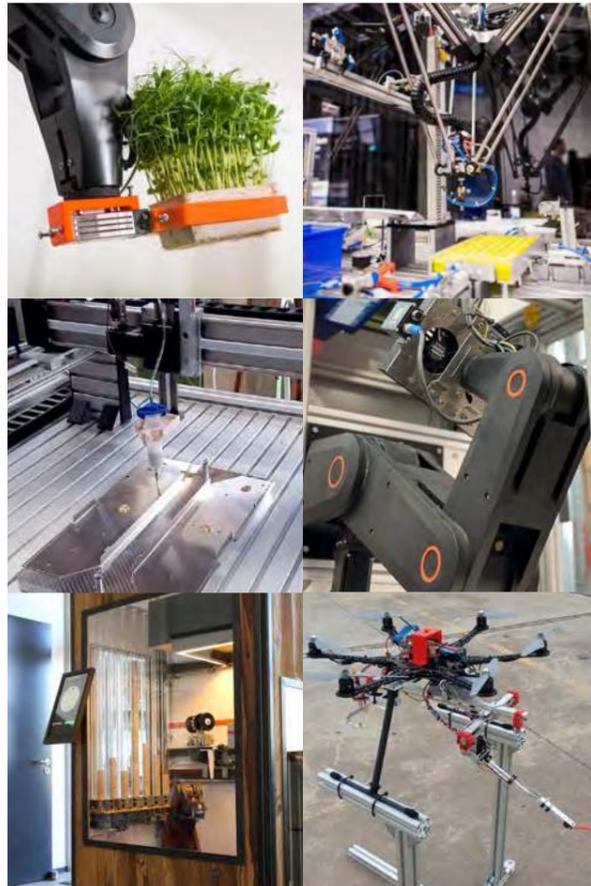
### Machine planner

Machine planning is now possible without an expensive CAD tool: with the Machine Planner, you can develop your automation application online and CE-compliant.

- ▲ Design a CE-compliant machine – without a CAD tool – in the browser
- ▼ Up to 5 times more cost-effective than classic robot solutions
- Already in use by over 5,000 igus® customers
- Systems expandable at any time

[configurator.rbx.com/mp](http://configurator.rbx.com/mp)





## Update

### Over 500 solutions under €12,000

Five years RBTX® by igus® – the Robotix marketplace

The RBTX® marketplace brings together users and suppliers of robotic components. The free video consultation and feasibility tests offer an easy introduction.

- ▲ Growing robotics product portfolio: 800 components, thousands of combinations
- ▼ Over 500 solutions online with 95% of them under €12,000
- Over 3,000 projects and free feasibility studies in 15 customer testing areas in Germany and 22 worldwide
- Durable industrial products from leading manufacturers, more than 130 partners
- 🔗 Guaranteed compatibility and the MyRobot configurator make it easy to find a customised solution [rbtx.com](http://rbtx.com)



## New

### App-World – Software for every application

Welcome to the future of automation!

From smart control applications to productivity tools – we bring the future of automation directly to you. Discover the latest software now and find the right apps and interfaces for your igus® Robot Control.



- ▲ The functionality of your robot is extended by additional functions and applications
- ▼ Reduce additional hardware or external systems, as certain functions can be integrated directly
- Graphical configuration directly in the igus® Robot Control software, as well as use in in-house factory automation
- One software with multiple possibilities



## Test before you invest

Unsure whether your use case is possible?  
Let us check it now.

- Exceptionally fast feasibility analysis without own setup
- With accessories such as grippers or vision sensors
- Direct testing with your workpiece in our robot cells
- Individual advice from automation experts
- Determining a fixed price with a parts list



[rbtx.com/customer-testing-area](http://rbtx.com/customer-testing-area)

## New

### Automate like a pro

Your application takes centre stage

You don't just want to program a robot, but also want to know how to get a complete application up and running? Whether dosing, palletising, pick-and-place or quality assurance, in the application training you will learn how to do it.

- ▲ Together we get the maximum performance out of your application. For beginners and professionals.
- ▼ Save time and nerves when setting up your application
- Over 1,000 hours of training experience from our training team
- You bring the expertise into your company for the long term





Update

## Inexpensive spiral conveyors

RBTX® Basics bowl feeder

Inexpensive and easy commissioning. Ideal for industrial areas. With the sorting function, the cycle time of the subsequent work processes is increased. Diameter 170mm for small components.

- ▲ Robust product design and easy commissioning
- ▼ Test before you invest: submit your components to us; 50 tests on bowl feeders alone
- A lot of experience of our partners is in the product
- Durable and versatile product
- Guaranteed compatibility and the MyRobot configurator make it easy to find a customised solution



# Further highlights

RBTX<sup>BASICS</sup>

RBTX® conveyor technology, 2x more cost-effective than usual on the market

**New**



RBTX® Basics rotary conveyor  
Separation/sorting of small components

**New**



RBTX® Basics step conveyor  
Transporting components into the application

**New**



RBTX® Basics conveyor belts  
Available in 2 widths:  
80 and 120mm, 1,000mm long

[rbtx.com/components/accessories](http://rbtx.com/components/accessories)

▲ Tech up ▼ Cost down ■ Proof ● Sustainability ↻ Digital

# ROIBOT 2024

Award for clever automation solutions

Apply now and win up to €5,000!



[igus.eu/roibot](http://igus.eu/roibot)

We want you!



# motion plastics®



## e-chains® and e-chain systems®

Page 26



## igidur® bar stock

Page 148



## smart plastics

Page 76



## igidur® 3D printing

Page 154



## chainflex® cables

Page 84



## igubal® spherical bearings

Page 160



## readycable® readychain®

Page 98



## xiros® ball bearings

Page 174



## Bicycle components

Page 106



## drylin® linear technology

Page 184



## igidur® plain bearings

Page 118



## dryspin® lead screw technology

Page 202



## igidur® rollers

Page 132



## drylin® drive technology

Page 212



## drygear® gear and gearbox technology

Page 136



## Low Cost Automation

Page 238



## igidur® slewing ring bearings

Page 142



## RBTX® market place

Page 258



New e-chain® guarantee Page 28



Office Chain Oval OCO.32.37.0 Page 30



E2C.38 one-piece e-chain® Page 32



Mounting brackets for E2.26 and E2.38 Page 33



Damper clip for E2i.48 Page 34



Magsnap for E2i.15 Page 34



New crossbars E2.26F and E2.38F Page 35



Study: Multicable e-spool® / SPMC e-spool® Page 35



E4Q.58L e-chain system® Page 36



Extension link for E4Q.58L Page 37



Locking separator 82.8 for E4Q.82 Page 38



TUB for the E4Q.44/ E4Q.58 and new SHM.60 hose holder Page 38



Universal interior separation for E4Q.64 Page 39



64Q.5 notch separator for E4Q.64 Page 39



Configurator for CFX strain relief clamps Page 40



Strain relief system C825.075.ZS and C1132.080.ZS Page 41



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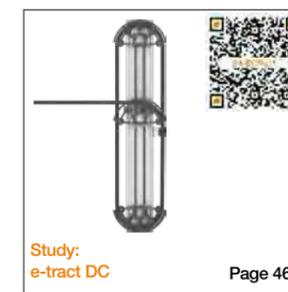
Study: YE.28 Page 43



YEHD.108/YEHD.112 mounting brackets Page 43



guidelok swing - self-adhesive version Page 44



Study: e-tract DC Page 46



Study: e-tract 3.0 retraction unit Page 47



C6.38 cleanroom e-chain® Page 50



Study: e-skin® soft SKS28.100.02.1 Page 52



e-skin® flat single pods in six sizes Page 54



Study: e-skin® flat layer holder Page 56



Mounting bracket for e-skin® flat single pods Page 56



i.Sense module GEN II Page 82



superwise integrated i.Cee module Page 82



CF.D module for bus cables Page 83



DriveCliq extension for CF.D module Page 83



Study: e-skin® soft ESD Page 57



e-skin® interior separation SK24.3.H.5 Page 58



Reinforced mounting bracket for e-skin® soft 20 Page 58



Study: e-skin® SKS24 / triflex® CSCS Page 59



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10/23 smart plastics mini wear sensor (MWS) Page 82



chainflex® Page 83



New chainflex® guarantee Page 86



triflex® R TRC fibre-rod system | ESD Page 60



triflex® R TRE.85.135.0.C Page 64



Robot equipment configurator Page 65



Study: e-spool® 4.0 for crane systems and handling equipment Page 66



chainflex® UL-listed Flexible Motor and Control Supply Cables Page 88



chainflex® CFSPECIAL.572 Page 90



New chainflex® PVC cables Page 92



chainflex® CFCLEAN with a guarantee of 40 million double strokes Page 94



Study: e-spool® flex light 2.0 Page 67



Smart support plates / floating moving end Page 68



e-loop® retrofit mounting console Page 69



SRM-L Steel Rotation Module Light Page 70



New logo for chainflex® cables Page 95



chainflex® CASE Refill Page 96



readycable® readychain® Page 100



readycable® cables for drive technology Page 100



iRM igus® Rotation Module Online Configurator Page 71



Study: TRM triflex® rotation module Page 72



e-spool® theatre 10m and accessories Page 73



Low-cost zig-zag Page 74



Expansion of ready-to-connect drive cables Page 102



Update to the EDS24 standard Page 102



CAT8 connectors for the data transmission of tomorrow Page 103



New Connector for SPE readycable® cables Page 103



e-spool® microphone and e-spool® microphone stereo Page 75



smart plastics Page 75



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superwise iComm box Page 80



Attachment housing for Module Connect Page 104



Bicycle components Page 108



Bike frame made of solid plastic Page 108



Modular injection moulded bicycle frames Page 110



Modular performance bike frame Page 110



Rotomoulded bicycle frame Page 110



Solid plastic wheels Page 111



Rotomoulded wheels Page 111



iglidur® SG-03 Page 131



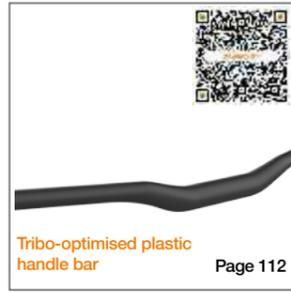
10/23 iglidur® F3 with ESD certificate



10/23 iglidur® ECO P210



iglidur® rollers



Tribo-optimised plastic handle bar Page 112



Freewheel made of solid plastic Page 114



Plastic bicycle pedal crank Page 115



Belt tensioner with xiros® ball bearing Page 115



Skate wheel made of iglidur® J Page 134



Roller adapter made of iglidur® P360 Page 135



Roller adapter made of iglidur® A500 Page 135



10/23 Rollers made of iglidur® A181



Plain bearings Page 116



Pulleys Page 116



Planetary crank gearbox Page 116



Bicycle wheel bearings Page 116



10/23 Rollers made of iglidur® W301



drygear® gear and gearbox technology



iglidur® AD210 Page 138



Large machined gears Page 139



iglidur® plain bearings



iglidur® JPF Page 120



iglidur® FPF Page 121



iglidur® IC-05PF Page 122



drygear® planetary gearbox DG-PLI-56-AD-AST Page 140



drygear® evoloid gearbox DG-EVO-42-18 Page 141



10/23 Study: Combination of plain bearings and gears



10/23 iglidur® S200 gears



iglidur® AX500 Page 123



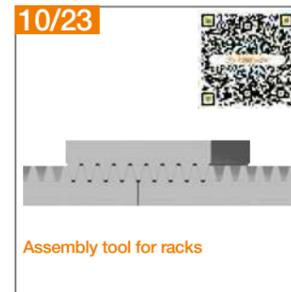
Calculate the CO<sub>2</sub> footprint for each component Page 124



iglidur® Q2LW Page 125



iglidur® ECON materials Page 126



10/23 Assembly tool for racks



iglidur® slewing ring bearings



Study: iglidur® PRT-06-100 Page 144



iglidur® PRT-02-30-WPC Page 146



Study: iglidur® "Large bearings" Page 128



Study: igutex® TXH Page 130



igutex® TX3 Page 131



iglidur® Q3E Page 131



iglidur® PRT-04-XX-ART-F Page 147



10/23 Universal diameters for type 04



10/23 PRT-04-100-CR with dry room certification



10/23 PRT-04 with FDA compliance and EU10/2011 conformity

10/23



PRT-01-30-ED

**iglidur®  
bar stock**




iglidur® JPF round bars  
Page 150



iglidur® S200 round bars  
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10/23



igubal® 2.0 rod ends in imperial dimensions

10/23



EC end cap for two hole/four hole flange bearings

10/23



Spherical balls for square profiles - new designs

**xiros® ball bearings**




xirodur® G220 round bars  
Page 151



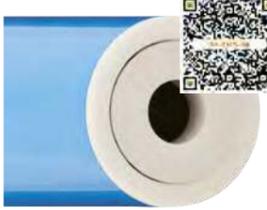
igutek P360 round bars  
Page 152



xirodur® B180 round bars  
Page 152



iglidur® F160 tribo-tape  
Page 153



PVC conveyor roller with C160 flanged ball bearings  
Page 176



Ball transfer unit with longer service life  
Page 178

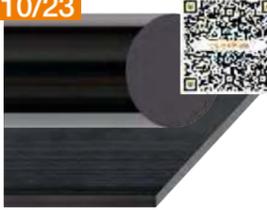


Polymer ball transfer units with glass balls  
Page 179



UCFL flanged ball bearing, 2-hole design  
Page 180

10/23



iglidur® F161 round bars and plates

10/23



iglidur® ECO A180 round bars

10/23



CNC service

**iglidur®  
3D printing**




Pillow block ball bearing, narrow design  
Page 181



Ball transfer unit with flange  
Page 182



Paper guide rings  
Page 182

10/23



Conveyor roller - hard-anodised aluminium tube



iglidur® i230 powder for SLS printing  
Page 156



iglidur® i9-ESD powder for SLS printing  
Page 158

**igubal®  
spherical bearings**




ESQM-2.0 pillow block bearing  
Page 162

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Conveyor roller - non-stick coated aluminium tube

10/23



Pillow block bearing with xiros® spherical insert bearings

**drylin® linear technology**



Guarantee  
igus Products  
**4**  
YEARS  
up to 4 years guarantee

Service life guarantee for drylin® linear and drive technology  
Page 186



Split flange mounted bearings  
Page 166



igubal® 4.0 sensor in spherical insert bearing  
Page 168



igubal® Food Contact  
Page 170



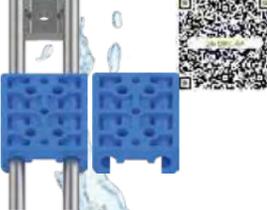
Spherical insert bearings made from iglidur® H3  
Page 172



Miniature linear carriage made of stainless steel  
Page 188



Double rails WS-06-20-ES  
Page 190



Miniature carriage made of iglidur® A230  
Page 190



Solid plastic carriage made from iglidur® RN403  
Page 191



Fixing collars made of polymers - more dimensions  
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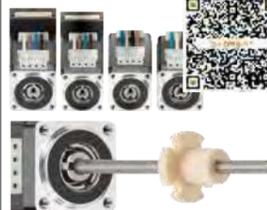
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10/23 Simply mount the ReBeL® gripper



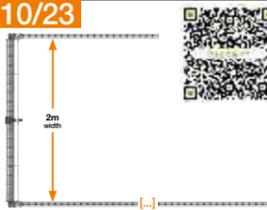
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10/23 Complete motor control system package



10/23 Programming of the workpiece coordinate system



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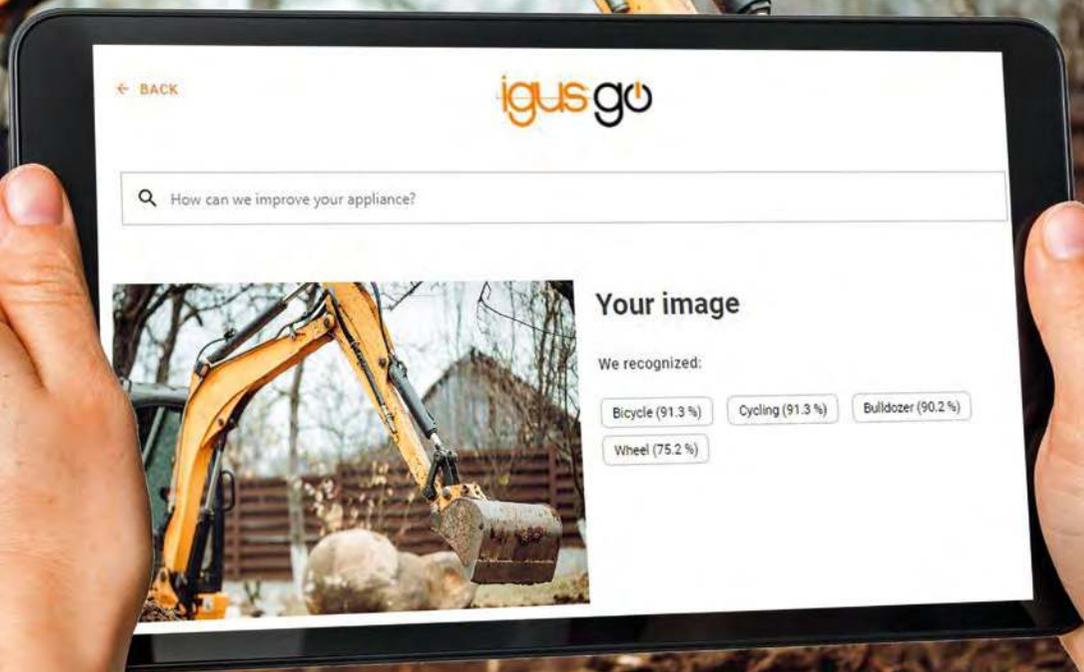
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