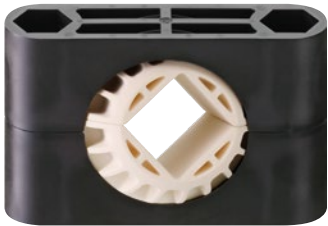


190 motion plastics® news

igus

Spring 2023



enjoyneering®

Page 2

Enter a new world - unleash your engineering power with play

igus:bike

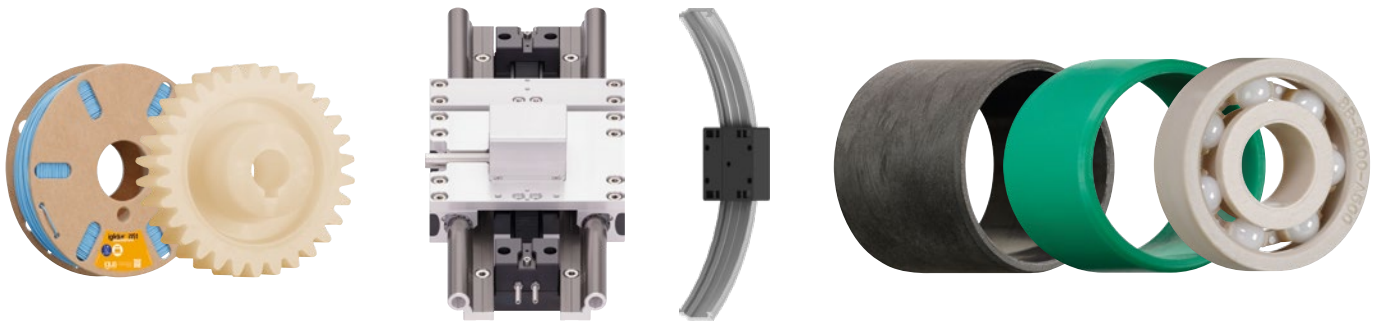
Page 14

From „ocean plastics“ to motion plastics®: an urban bike made from recycled plastic

motion plastics®

Page 16

High-performance polymers for motion in all applications ...
... improve what moves



26 dry-tech®

Lubrication-free made easy



140 Low Cost Automation


Automation for companies of all sizes



iglidur® polymer plain bearings
Page 26



xiros® polymer ball bearings
Page 78



iglidur® slewing rings
Page 38



drylin® linear technology
Page 86



iglidur® bar stock
Page 46




dryspin® lead screw technology
Page 112




iglidur® gears
Page 52



drylin® drive technology
Page 120



iglidur® tribo 3D printing
Page 58



Low Cost Automation
Page 140



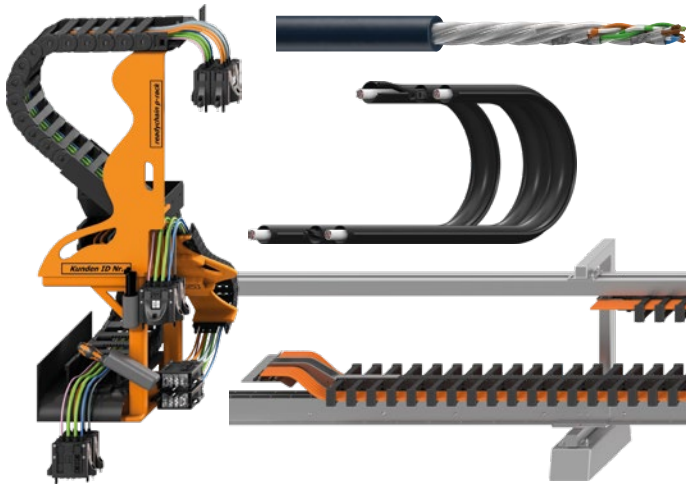
igubal® spherical bearings
Page 66



RBTX marketplace
Page 168

178 e-chain systems®

Moving energy made easy



e-chains® and e-chain systems®

Page 178



smart plastics

Page 222



chainflex® cables

Page 234



readycable® readychain®

Page 246



Tech up



Cost down



Proof



Sustainability



Digital

Future

#enjoyneering



Frank Blase,
CEO & Entrepreneur

Dear customers,
what if we not only offer you products that bring you technical progress, but you could simulate these parts in your machine or system in advance? If you took a photo of your application and a software showed you where the use of high-performance plastics could bring an improvement or save costs?

How can we make engineering simpler, easier to plan, more economical and ultimately also more sustainable? By bringing our products and your application into virtual reality. We call this enjoyneering, and on these pages, we will show you what we mean. The heart of igus® is and will always be our high-performance plastics. Browse through our latest products and studies, from the iglidur® plain bearing made from 94% renewable raw materials, to the xiros® ball bearing for high temperatures with ceramic balls, the energy chain for dry cleanrooms, to the study for drylin® R linear plain bearings on wooden shafts.

Apart from our products, we will show you the design of a heater in which machine heat is fed into a fan heater. We plan on making this energy-saving concept accessible to everyone - the prototype is already heating one of our production halls.

All the best for an innovative year,

Frank Blase

igus® digital news and solutions

enjoyneering® ... unleash your engineering power with play



#digitalnews

"Like an avatar in James Cameron's yet-to-be-filmed blockbuster "Industrial Avatar" - this is how a journalist describes her experiences during a preview of the iguverse®, the digital twin of the igus® factory. Digital twin? Virtual reality? Augmented reality? Aren't all these terms familiar from the techie world that make you wonder if it's just a hype that will soon pass?"

We've been experimenting a lot with these technologies over the past few months to see how we can use them for our customers and products. Suddenly doors open: there are opportunities to meet in a virtual room and fine-tune models, with igus® digital news and solutions enjoyneering®... unleash your engineering power with play, a simple tablet

and artificial intelligence to display igus® products in an excavator shovel, and let them take you directly to the right plain bearing in the online shop. Regardless of space and time, teams from anywhere in the world can work together on a machine in virtual reality, develop parts and plan installations. Training can take place on machines, our customers can in turn use this virtual world to demonstrate their own machines. It's fascinating what has suddenly become possible: incorrect assembly can be avoided because you can first test everything digitally. Configurations can be fine-tuned before the wrong products are ordered, travel times are eliminated because people can meet in virtual space. With playful ease, digital technologies help us to become familiar with our products and to select the ideal product for an application. We call this enjoyneering® - unleashing your engineering power with play. Many of these developments are already so advanced that we can show them at the Hannover Messe. It is important to us that we always have the answer to the question "What do you get out of it as a customer?" and not just lose ourselves in technologies. You can see some of the highlights that we show here in the following pages.

Download the brochure with more information about the individual digital services and solutions or visit our website igus.eu/enjoyneering

#enjoyneering #digitalnews #virtualworld



igus® digital news and solutions



1) iguverse® - virtual engineering

Implement developments of systems and machines 10 times faster?¹

"As an engineer, I was able to sustainably optimise prototypes. With VR, I network, solve problems and save resources. The virtual world helps to identify weaknesses early on."

igus.eu/iguverse

2) igusGO - revolutionary AI product search

Design and improve applications
lubrication-free in seconds

Experience a revolutionary way of searching for products with igusGO - our cloud platform with artificial intelligence.

igus.eu/igusgo



3) kopla - software platform

Create customised design and calculation tools

The kopla software platform provides engineers and designers with the tools they need to create and share their own online design and calculation tools.

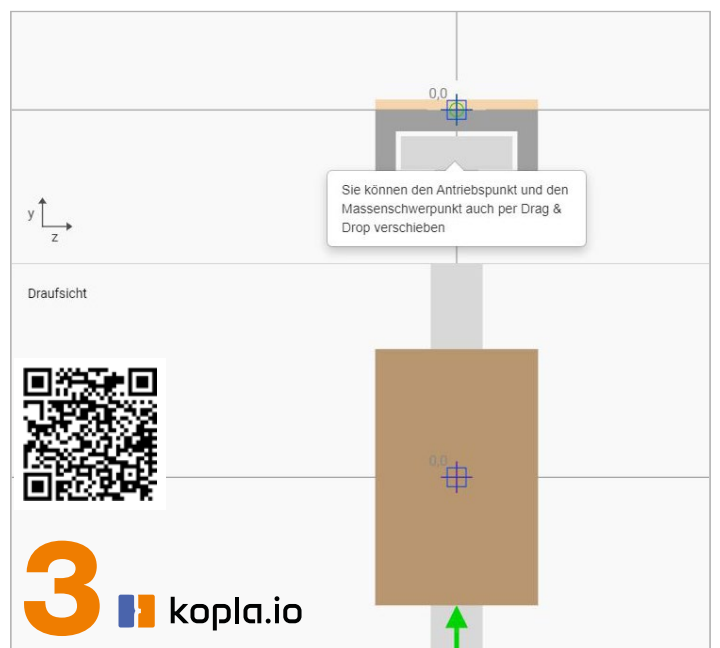
igus.eu/kopla

4) iIdentify - AI spare parts service

Quick procurement of spare parts with AI

Downtime of production lines due to missing spare parts is expensive. igus® offers a solution: simply send a photo of the component and AI will identify it. This reduces downtime and costs. Try it or share the tip!

igus.eu/identify



1) See example: Bell Helicopter, HTC VIVE: youtu.be/9rF2NBEHOow



5) Augmented reality

Maximum transparency and security in system planning

Maximum clarity. Faster and more cost-effective feasibility studies and product integration testing. Save time and money and identify possible errors even before a prototype is created.

igus.eu/AR

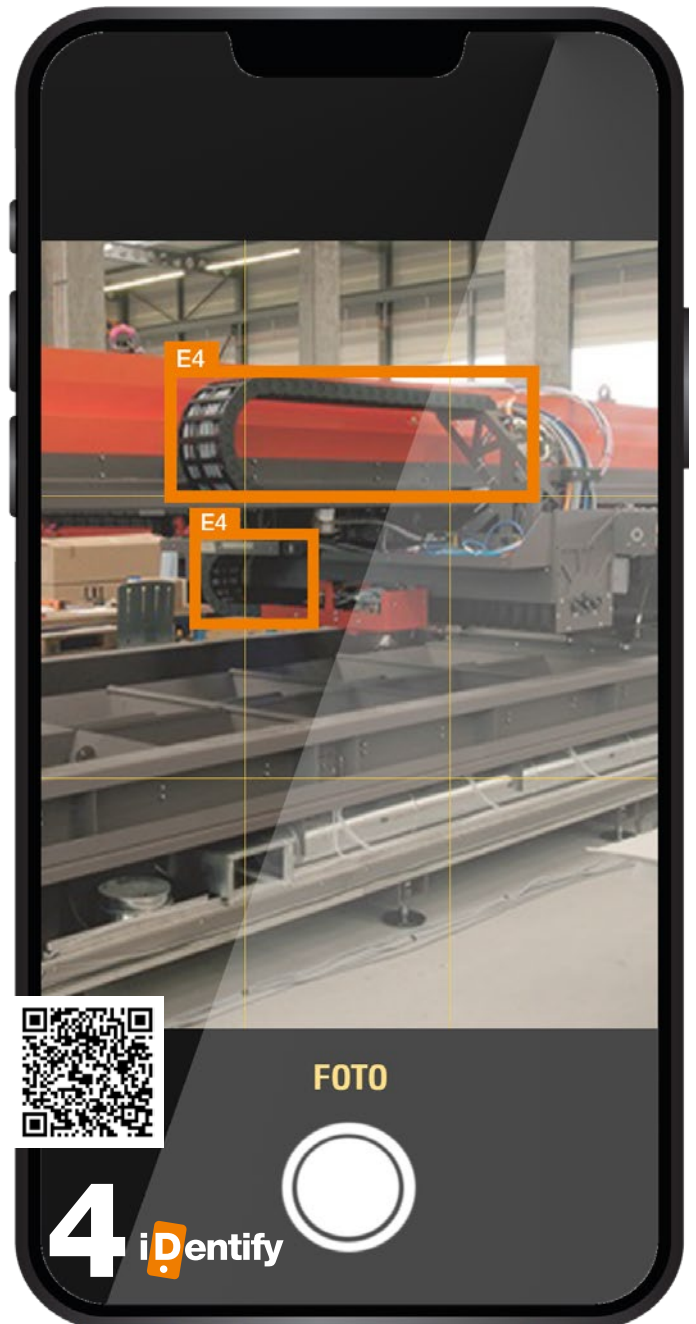
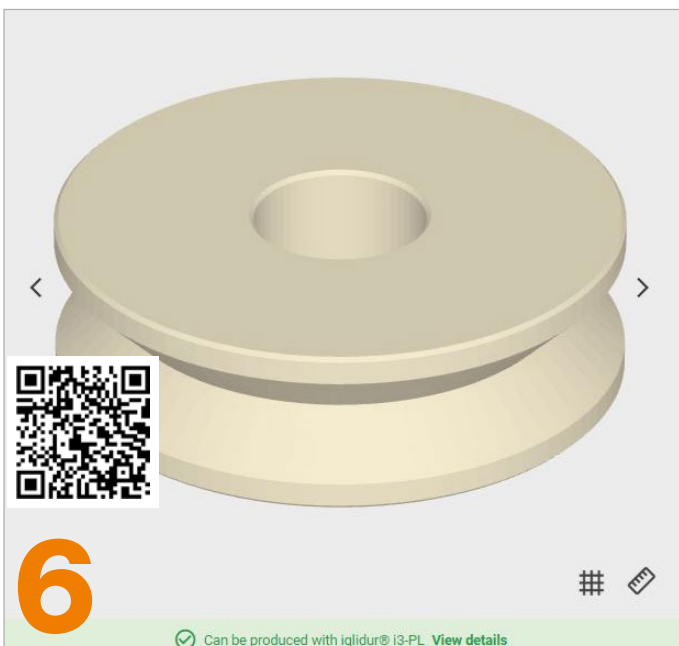
6) speediPrint – motion-on-demand

Industrial 3D printing service

Fast, custom-made spare parts for your production plants

Industrial manufacturing service for wear-resistant parts. We recommend the best manufacturing process, you choose the desired service life. Unique tool thanks to the igus® experience in motion plastics®.

igus.eu/mod



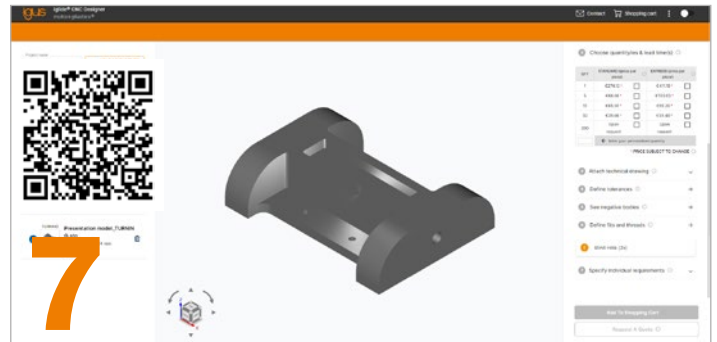
"The third wave of the internet is about innovatively addressing real world problems."

Steve Case, Founder of AOL

7) speediCut – motion-on-demand CNC service – Request or order machined parts made of iglidur® conveniently and quickly online

„As a designer, I often need custom components made of igus® iglidur® material. The new CNC Service 2.0 offers fast, transparent price calculation and automated feasibility analysis. The tool reviews technical drawings and provides visual feedback. Express option available.“

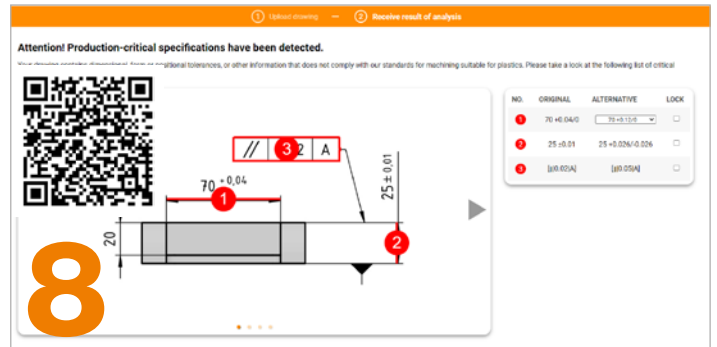
igus.eu/speedicut



8) Tolerance check – motion-on-demand Check technical drawings of machined parts in seconds

„As a designer of iglidur® machined parts, I can have my technical drawings checked in just a few seconds with the igus® online drawing check. The tool marks unfeasible dimensional, shape and position tolerances and shows me correction suggestions. In this way I get technical feedback quickly and easily in order to eliminate uncertainties and get my components ready for production.“

igus.eu/tolerance-check



9) RBTX - marketplace for Low Cost Robotics Optimise your automation solution

Components from leading brands | Return on investment 3-12 months | Automate without knowledge of robotics
Many 2023's new products, 700 practical references online, immediately adaptable for you.

rbtx.com/en



10) Change Marketplace for recycled technical plastics

Our raw materials are too valuable to be incinerated. We need to take a different path, from the linear economy to the circular economy. igus® is therefore committed to innovative recycling of its own and other plastics.

change.igus.eu



11) igus:bike

New bikes for a new era

The igus:bike platform shows the current state of the art and helps bicycle and component manufacturers to network and exchange information with each other - together we are moving in the direction of future mobility. With recycling plastics, lubrication- and corrosion-free. igus.bike/en



12) Online configurators

Reduce process costs and configure products more efficiently

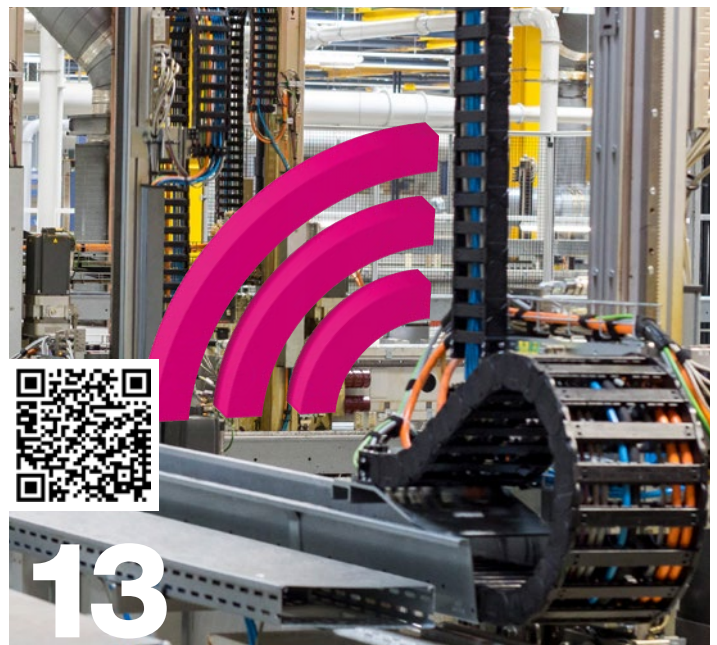
Experience a faster and more efficient way of configuring the product with the online tools from igus®. Select the most sustainable service life. igus.eu/tools



13) smart IIOT

Record operating states, evaluate machine data, extend product service life, configure more efficiently

Smart solutions for condition monitoring and predictive maintenance, longer products service life and maintenance costs savings with smart plastics from igus®. igus.eu/smart-plastics



14) igumania® - idle game

Fight against maintenance & plant downtime and unlock new solutions!

Immerse yourself in the world of igumania® and, as the production manager of a Mars Rover factory, fight against unplanned maintenance and plant downtimes together with your assistant Rusty. Learning by playing, that it's already possible today igus.eu/igumania



"One difference between the world's leading architects and the others is: They know how to play."²

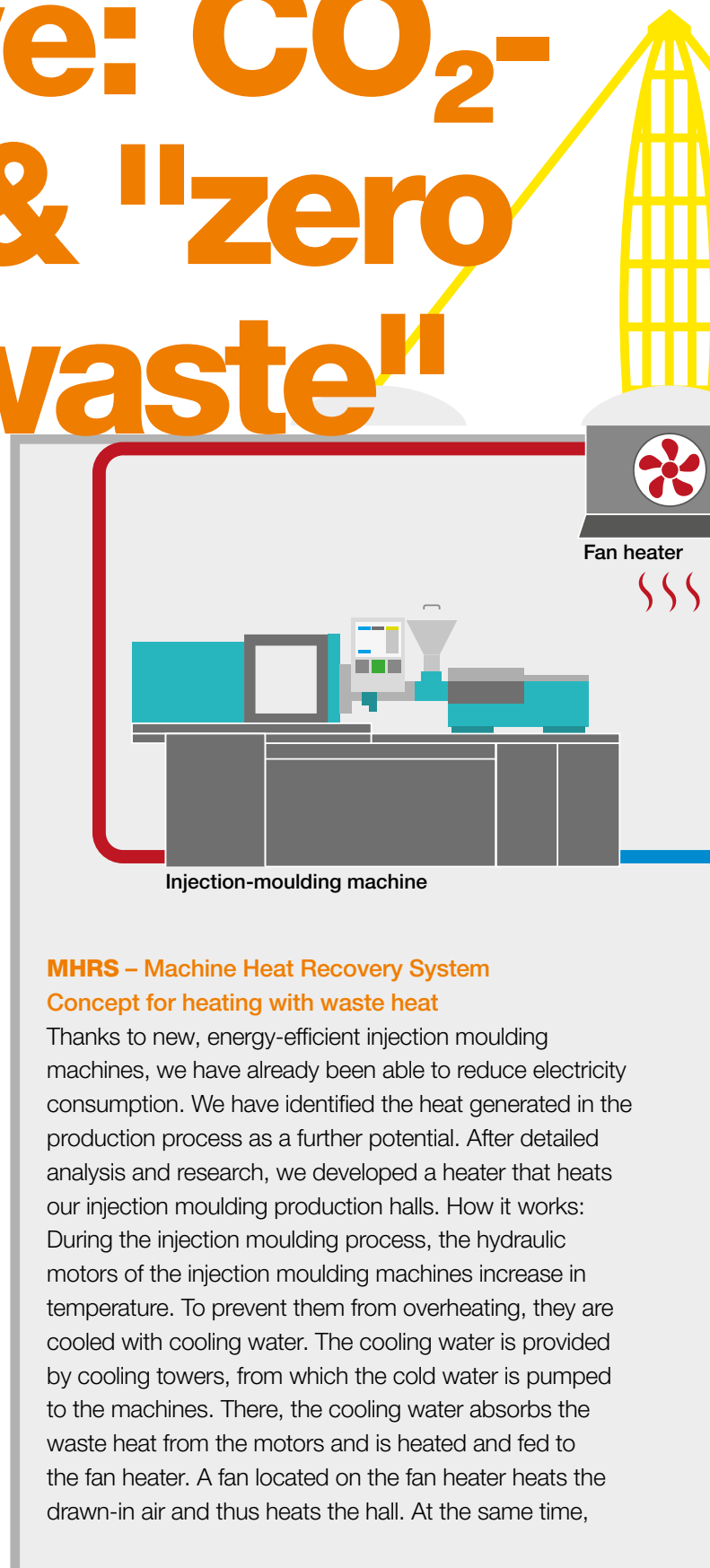
A tough goal. But we are on the right track.

Corporate objective: CO₂-neutral & "zero plastic waste"

As a plastics producing company, should igus® strive for sustainability? We believe that every company bears the responsibility to produce and operate sustainably. For us, this aspect is the focus of our entrepreneurial activities. Since we produce a heavily discussed material, in addition to reducing emissions and resources, we also have an eye on the plastic itself. Can plastics for motion be sustainable? Yes, we know they can. They are durable, make environmentally harmful lubricants obsolete, can be recycled and returned to production as regranulate or recycle. Or you can make something completely different out of it: maybe a bicycle made of plastic. In addition to our own efforts to act sustainably, we support the ideas and projects of other companies, clubs and organisations. For example, the British company Mura Technology Ltd. is currently building the first recycling plant for unsorted plastic waste in England, and we were an investor from the outset. Waste is turned into crude oil again here, and another plant is being planned, in Germany.

More information on the sustainable aspects of our products and on projects and initiatives can be found at igus.eu/sustainability and the following pages.

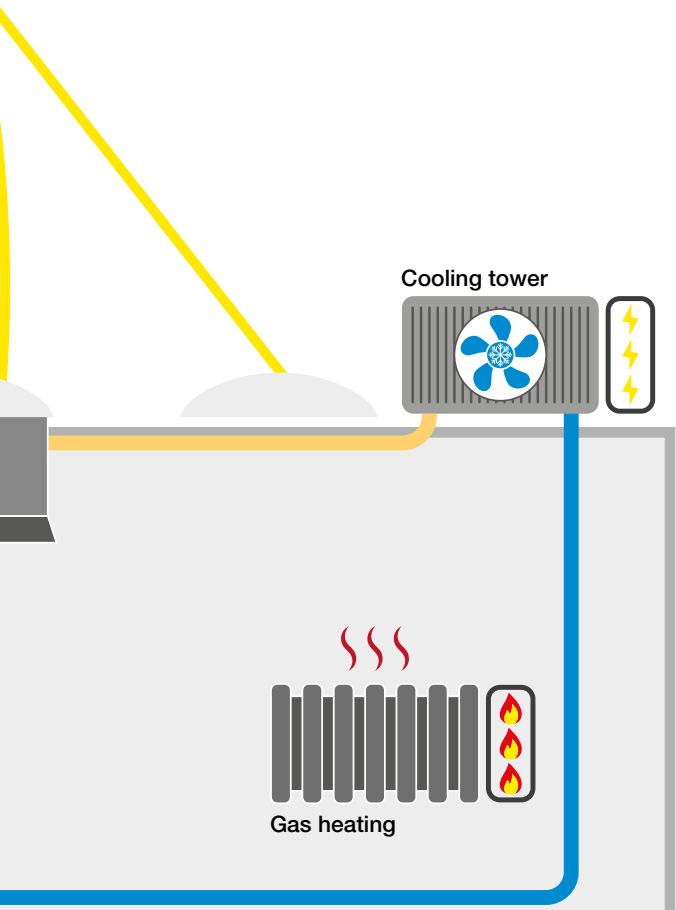
[#sustainability](#) [#energy-saving](#) [#recycling](#)



MHRS – Machine Heat Recovery System Concept for heating with waste heat

Thanks to new, energy-efficient injection moulding machines, we have already been able to reduce electricity consumption. We have identified the heat generated in the production process as a further potential. After detailed analysis and research, we developed a heater that heats our injection moulding production halls. How it works: During the injection moulding process, the hydraulic motors of the injection moulding machines increase in temperature. To prevent them from overheating, they are cooled with cooling water. The cooling water is provided by cooling towers, from which the cold water is pumped to the machines. There, the cooling water absorbs the waste heat from the motors and is heated and fed to the fan heater. A fan located on the fan heater heats the drawn-in air and thus heats the hall. At the same time,

* according to scope 1 + 2, at our Cologne facility



the heated cooling water cools down during this process and is pumped back to the cooling tower. The process starts over. With this in-house heating system, we will be able to reduce gas consumption to zero in the future. We are convinced that the concept can be interesting for many industrial companies and will make the mature concept available, free of charge.



Dennis Berninger
 Factory Manager
 Bearing Technology
 Project Manager MHRS

igus.eu/MHRS

CO₂

31.2%

CO₂ savings 2021 compared to 2020*



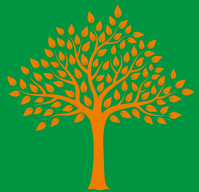
150

renewed IT equipment sold internally and proceeds donated in 2022



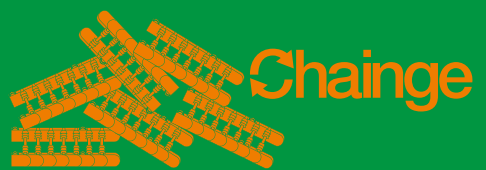
196

new energy-efficient injection moulding machines
 275 old machines exchanged for new ones between 2021 - 2022



64,405

trees planted since 2020



75,000kg

of material returned as part of the "Change" recycling program since 2019

Projects and initiatives we support



"The plastic in the garbage dumps of the world is becoming a valuable resource."

1) Rheinkrake - floating garbage trap in the Rhine

Every day, a ton of waste floats across the Rhine into the North Sea. The Cologne-based Association K.R.A.K.E. ("Krake" means octopus) has been rolling up its sleeves to tackle rubbish in and around the Rhine for years. With the floating waste trap, the association took a big step further in September 2022. Waste floating on the surface drifts into the London-style passive trap. The waste trap is emptied and the waste recorded on land by the association members on a regular basis and scientifically evaluated in cooperation with the University of Bonn. In this way, a long-term study on plastic waste in the Rhine will hopefully be carried out. We are happy to support this project

3) Plastic Fischer - against plastic waste in rivers

8 to 12 million tons of plastic end up in the oceans every year, mostly via rivers. Plastic Fischer's approach of collecting waste in the rivers is more cost-effective than getting it out of the sea. How does the project work? Local people fish the rubbish washed up in devices from rivers and receive a regular income in return. The plastic waste, which is mostly classified as non-recyclable, is forwarded to thermal recycling plants and incinerated with energy recovery. Altogether, igus® funds the collection of 10,000kg of plastic waste. This gave at least 34 people a regular income and, on some days, additional workers helped out.

2) Recycling meets mobility - the igus:bike project

A bike that does not rust. No maintenance, no lubrication. Together with strong partners, we are building the urban bike of tomorrow: robust, durable and made of more than 90% plastic - from the frame to the bearings and the toothed belt. A high proportion of the required raw materials can be covered by recycling plastic waste. Our vision is to develop a manufacturing concept for bicycles made from plastic waste that can be set up at the site where the plastic waste is created.

More about the bike at igus.bike/en

4) International tree plantings

We do not plant trees to improve our carbon neutrality record, but because it is important to us. As of March 2023, we have planted 64,405 trees worldwide since 2020. Some planting is a long-term project, such as the forest test laboratory in Brandenburg, where the climate stability of trees for the (dry) future is being researched. Sometimes aromatic herbs were planted alongside trees for afforestation, as in Spain in Valdecans. Conservation of nature is not a one-off thing and so we will continue to plant trees and support initiatives with all our branches. Here is an overview of our planting campaigns:

igus.eu/trees



1

#sustainability #recycling



2



iglidur® N94
► Page 33



iglidur® PRT-02-30-ECO
► Page 44



3



Change Recycling Program
► Page 190



drylin® J4UM
► Page 103



4



xiros® ECO
► Page 85



3D printing spools
► Page 65

motion plastics® news

Where are igus® materials used here?



Find the solution here!
Maintenance-free and low-friction motion plastics®
operate in extreme weather ...



Find the solution here!
motion plastics® support
patented tilt mechanism ...

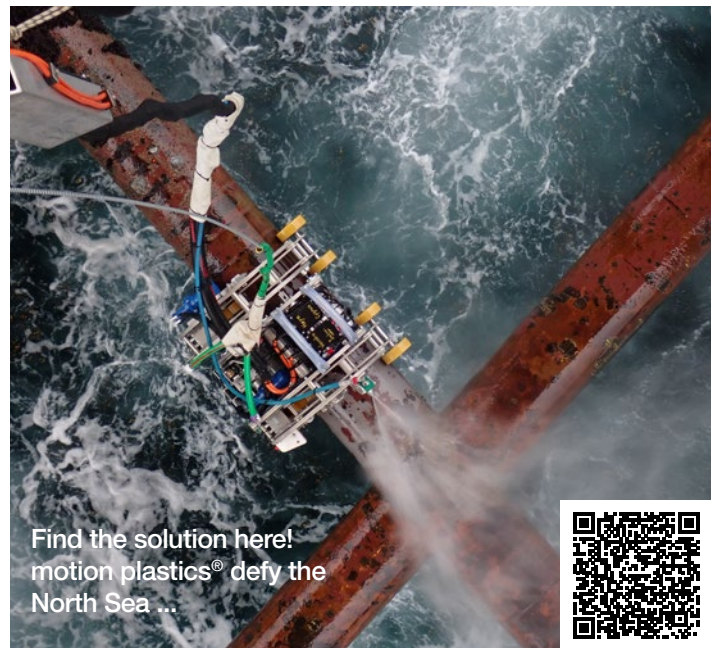


Sign up for the newsletter
now and find the answer!
igus.eu/newsletter

#newsletter

What can you expect?

Trade show tickets ... free samples ... exciting white papers
... online digital tools ... and much more information about
motion plastics® and the topics of Tech up and Cost down.



Find the solution here!
motion plastics® defy the
North Sea ...



Find the solution here!
Without chemicals: delta robot
destroys weeds with a zapper ...

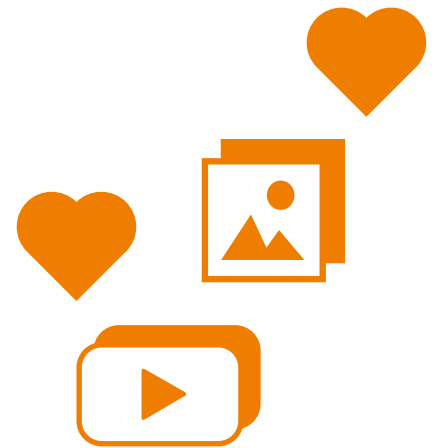




Find the solution here!
motion plastics® follow the profile and
provide maximum service life ...



Find the solution here!
motion plastics® withstand high forces,
weather, heavy vibrations & dust ...



Follow us on social media
and stay up to date with all
the exciting news, product
information and behind-the-
scene insights from the igus®
world.

Where can you find us? We are represented on
LinkedIn, Facebook, Instagram and Youtube.


#socialmedia



igus:bike

Bike to the future



#recycling

From "ocean plastics" to motion plastics®: igus® CEO Frank Blase already had the dream of an urban bike made of recycled plastic at the end of the 2000s. Thanks to modern high-performance plastics, it should be lubrication-free and maintenance-free, drive reliably in all weather conditions and never rust. Together with the Dutch start-up mtrl, the vision was implemented and a prototype presented at last year's HMI - and a lot has happened since then.

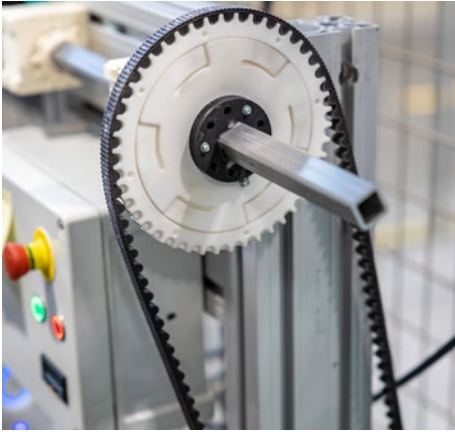
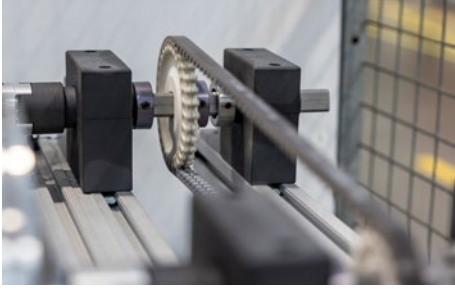
The developers carried out a lot of lab tests to find the best shapes and materials for each component. Tests have been running on our test rigs for months to make sure that the bike is durable. The belt drive, for example, has now covered 19,500km, the crank 21,000km and the ball bearings 21,000km without any problems. The tests are being intensified and also carried out under real conditions

outside the laboratory so as to offer customers a safe product that they can enjoy for many years.

With the igus:bike designed by mtrl, we are fully committed to sustainability: previously, we wanted to offer a new version and one made from recycled materials; now, we have decided to only sell a recycled version. At the end of June, we will be presenting ready-to-ride bicycles at Eurobike in Frankfurt, one of the world's most important bicycle trade shows. We will offer the igus:bike designed by mtrl from the end of August/ beginning of September in a limited number in the Cologne-Bonn-Düsseldorf region.

[#sustainability](#) [#urbanbike](#) [#vision](#) [#recycling](#)

www.igus.bike



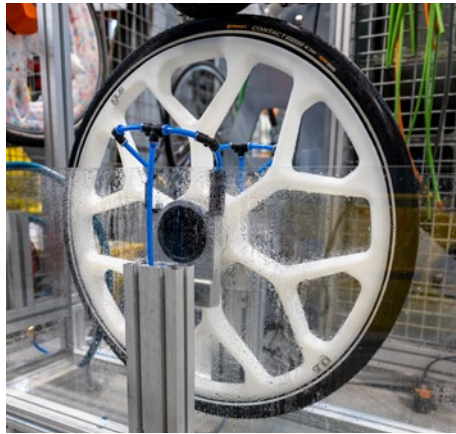
Ongoing tests ...
 Belt drive:
 18,500km
 Crank: 20,000km
 Ball bearings:
 21,000km
 ... without any
 problems



GERMAN
 DESIGN
 AWARD
 WINNER
 2023



reddot award
 winner



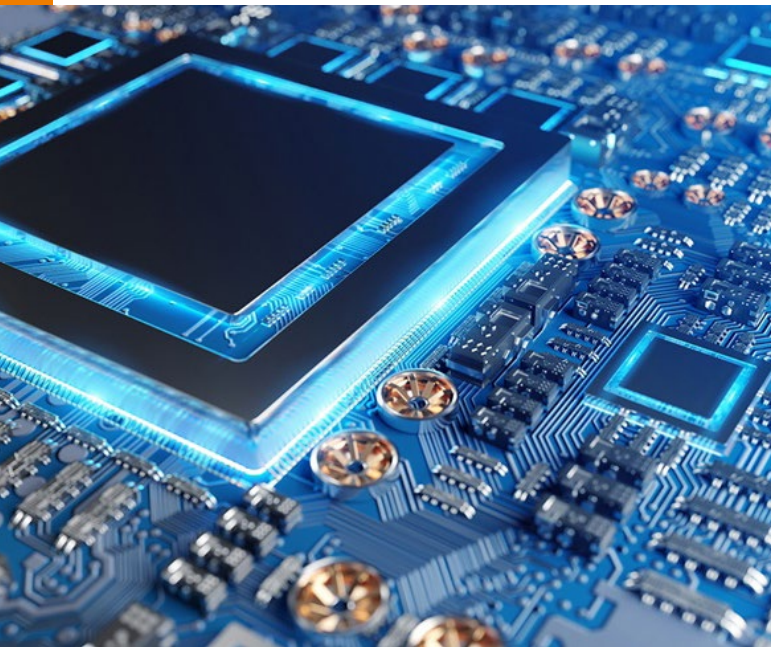
From "ocean plastics"
 to motion plastics®



clean plastics for safe, economical cleanrooms

motion plastics® in #cleanroom

@semiconductorindustry
@displayindustry
@microelectronics



Whether microelectronics, medical technology or the food industry: whenever the highest hygiene standards according to cleanroom class ISO 1 are required, igus® is in the forefront with lubrication-free and abrasion-resistant components - including energy chains, cables and hoses, linear guides and slewing ring bearings.

A particle, 0.0001 millimetres small: in our everyday world, this tiny object seems insignificant. But in the miniature world of electronics production, several billion transistors exist on chips barely larger than a fingernail. Particles that are invisible to the eye have the destructive power of a meteor. igus® knows that too. We therefore develop high-performance polymer products for cleanrooms that are extremely abrasion-resistant. Energy chains, cables and hoses, linear guides and slewing ring bearings, tested in our own cleanroom laboratory and certified according to the strictest cleanroom class ISO 1 (DIN EN ISO 14644-1). Almost no abrasion occurs during operation, so that there are only ten particles of size 0.1 micrometres in one cubic metre of air. For comparison: next to a smoker, around 100,000,000 particles larger than 0.5 microns buzz through the air - a size that is not allowed to occur in ISO Class 1.

Requirements in 1m³ of ambient air:

max.
10 particles of
max.
0.1µm

= 0.0001mm in size

Source: igus® GmbH; <https://blog.igus.eu/en/boost-to-your-overall-equipment-effectiveness-oes/>

#cleanroom



e-skin® SKS24
▶ Page 202



Clean SCARA Cable Solution
▶ Page 203



E6.29 e-chain®
▶ Page 194



iglidur® PRT-04-100-CR
▶ Page 43



e-skin® flat ESD
▶ Page 199



C6.29 cleanroom e-chain®
▶ Page 198

Heavyweight champion for agricultural machinery,
excavators & industrial cranes

motion plastics® for #heavyduty applications

@agriculturalmachinery
@excavators
@industrialcranes



"One who knows plastic, uses metal!" - an old saying that has long since become obsolete. Plain bearings made of high-performance plastic are now so robust that they can carry a weight of up to 16 tons. They are perfect for heavy-duty applications in agricultural machinery, excavators and industrial cranes.

Plastic: By this term we do not mean an everyday material. Rather polymers, tuned like a sports car. Enriched with fibres and fillers that massively increase durability. For example, plastic bearings are created that are true heavyweight champions and can withstand surface pressures of more than 100MPa - which corresponds to ten kilograms per mm². Thousands of users from all over the world prove that it is worth replacing classic metal bearings in agricultural machinery, excavators and industrial cranes with such heavyweight champions. Because polymer bearings are not only robust. They're also durable and fail-safe because their flexibility means they absorb shocks and bumps better than many metal competitors. In addition, the bearings made of high-performance plastic do not require any lubrication thanks to integrated solid lubricants. Users save material costs and maintenance effort. And don't forget: polymer bearings are many times lighter. A saving that helps make applications more energy efficient.

igutex® TX3 plain bearings
tested up to

100 MPa

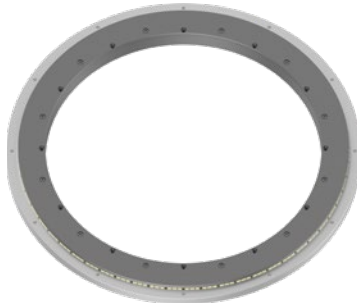
#heavyduty



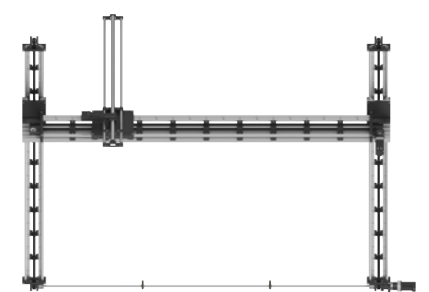
iglidur® TX3
▶ Page 28



drylin® NT-HD
▶ Page 108



iglidur® PRT-01-700
▶ Page 40



Palletising linear robot
▶ Page 155



iglidur® Q3E
▶ Page 30

Reduce installation space by up to 70%

motion plastics®

in

#smallspace

@aviation
@automotiveindustry
@railindustry
@camera+filmtechnology
@furnitureconstruction
@machinetools

Bending factor

← 3xd

for control cable
chainflex® CF98.PLUS/CF99.PLUS

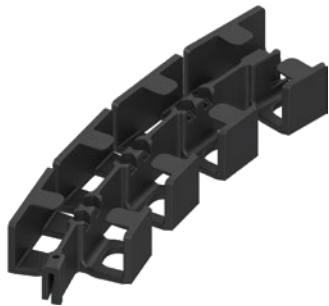
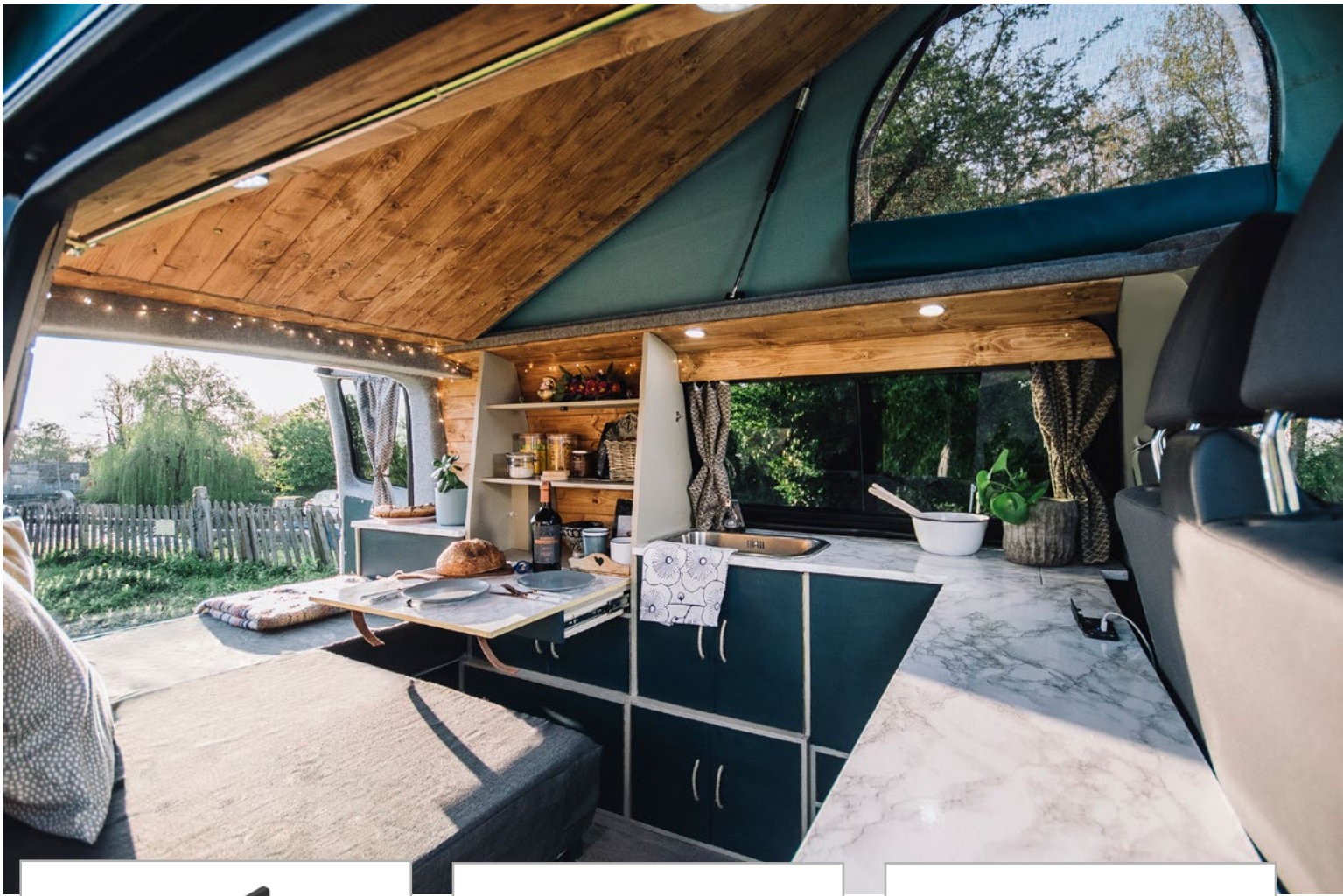
In the midst of the automation boom, space is becoming scarce in many factories. Compact machines and systems are in demand. A development to which we respond with space-saving components: including compact low profile guides, linear modules, cables, energy chains and plain bearings.

In cities, living space is becoming increasingly scarce, so creativity in the smallest of spaces is often required when furnishing. The same thing happens with designers. Space is at a premium in more and more factories and customers are demanding compact machines and systems and solutions that are at the same time increasingly fail-safe and low-maintenance. Not only in the industrial sector, but also in the private sector - for example for fully automatic coffee machines and bread baking machines.

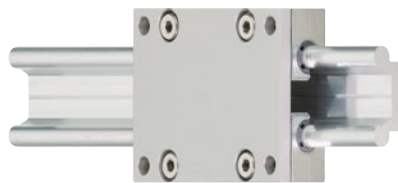


Requirements that can often hardly be met with classic components. igus® knows that too. That's why we now offer many of our products in small versions. These include flat guides of the drylin® N series and linear modules of the drylin® SLWC series, which save up to 70 percent installation space. Cables of the chainflex® series with exceptionally tight bend radii. And space-saving toothed belt axes of the drylin® ZLW series. All components are not just small space savers. They are also lightweight, quiet, cost-effective and maintenance-free thanks to their lack of lubricants. It is therefore also ideal for other areas such as furniture construction, small living spaces or campers.

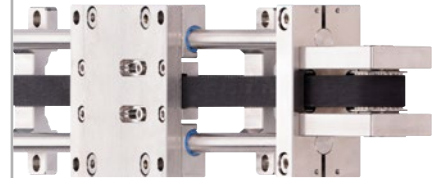
#smallspace



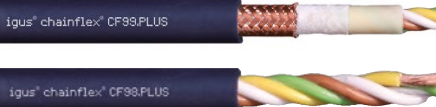
draw e-chain®
▶ Page 187



drylin® WW-06-20-xx
▶ Page 94



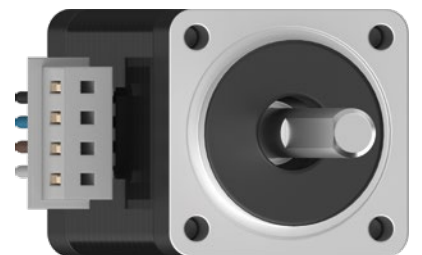
drylin® ZLW
▶ Page 124



chainflex® CF98.PLUS/CF99.PLUS
▶ Page 236



igidur® micro gear
▶ Page 55



Small motors from NEMA8
▶ Page 130

Extra-cost-effective solutions from the
"Tech up, Cost down" range

#superlowcost motion plastics®



Use of
Low Cost Automation:

approx. 70 to **75%**
cost advantage
and between
3 & 12 months
payback

Do experiments with automation, build cost-effective prototypes: igus® offers entry-level series of products, such as linear axes of the drylin® econ series, so that designers can avoid oversizing and go easy on the budget. In addition, an ever-growing portfolio of Low Cost Automation.

Oversizing is unnecessary. When purchasing components, designers often pay for functions that they do not need. The same goes for many small and medium-sized companies that want to experiment with automation as cost-effectively as possible. The answer from igus® to this dilemma is the cost-effective entry-level series, reduced to the basic functionality. They include linear axes for the drive technology of the drylin® econ series. Configured ready for installation quickly with online tools, the linear axes are an economical alternative to costly self-made solutions for simple positioning and adjustment tasks. Thanks to their lack of lubricants and lightweight design, they are also a particularly ecological option. In addition, igus® offers an ever larger portfolio of Low Cost Automation. Fresh on board: ReBeL® KID, an articulated arm robot, mostly made of high-performance plastic. For only 3,999 euros. It enables a low-risk entry into automation and a quick return on investment.

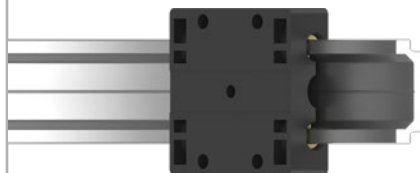
#superlowcost #automation



ReBeL® Environment
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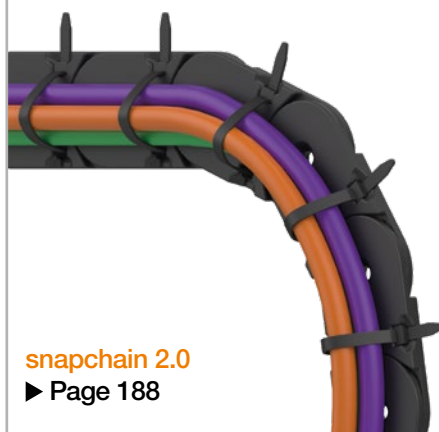
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drylin® econ product range
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snapchain 2.0
▶ Page 188

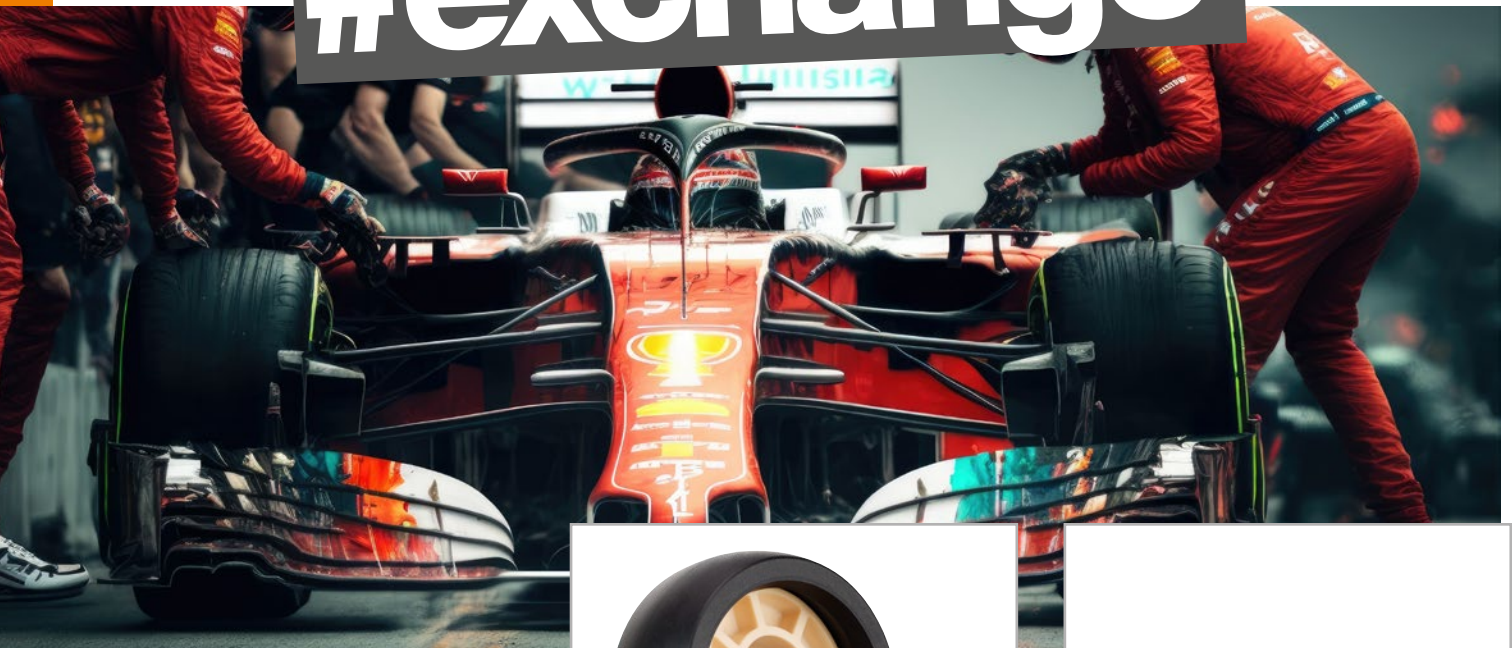


Cable Clip TR.COB.05
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Simply exchange metal for plastic

motion plastics[®] for fast

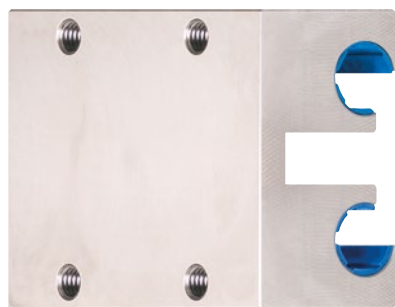
#exchange



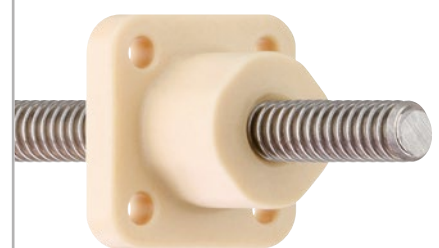
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dryspin[®] lead screw technology
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FDA-compliant & certification according to EU regulation 10/2011

motion plastics®

for #food



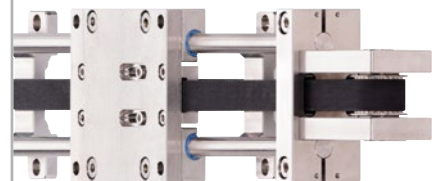
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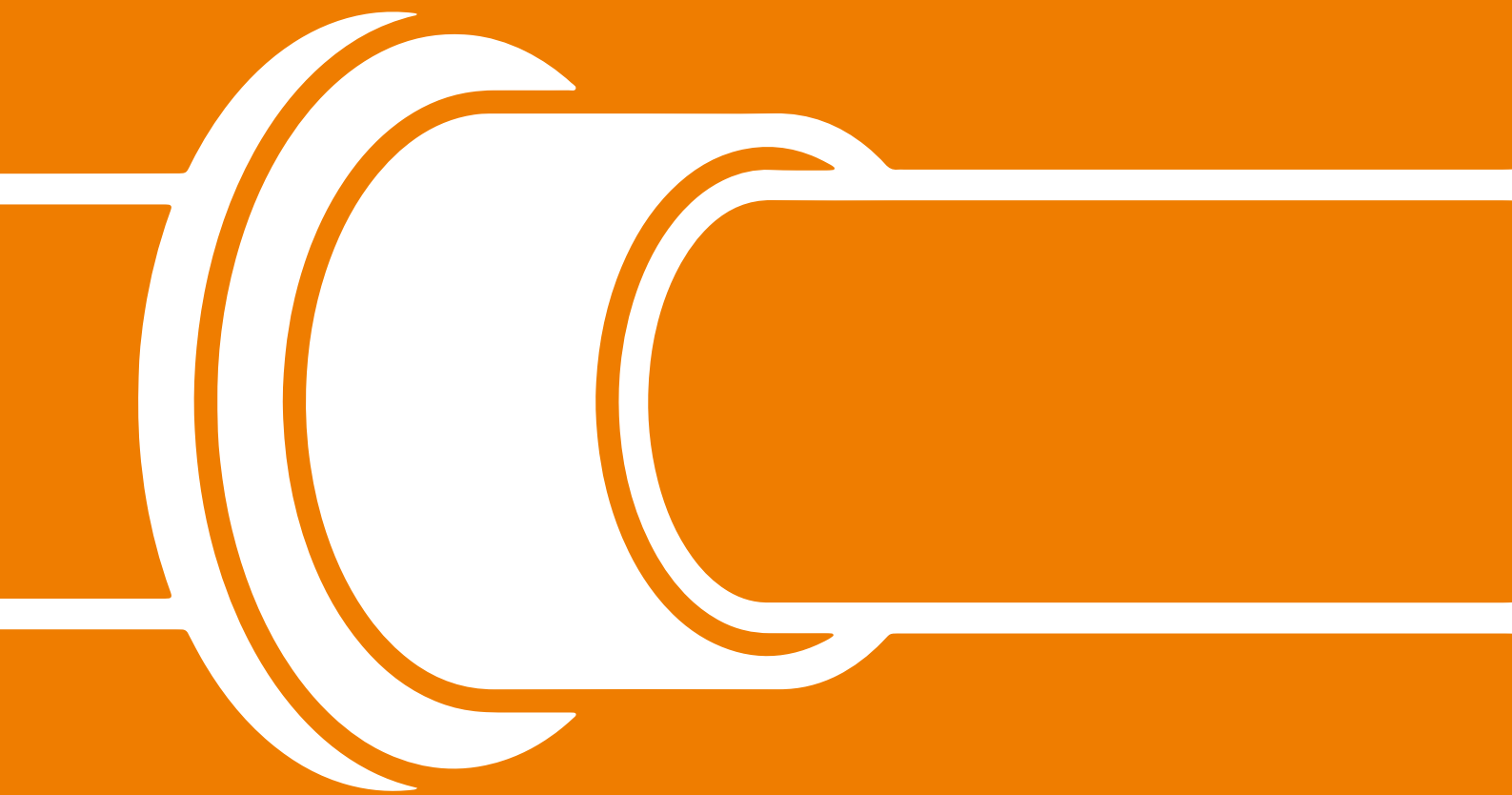
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dry-tech® | Lubrication-free made easy ...

iglidur® polymer plain bearings



igus.eu/news-iglidur

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Tech up



Cost down



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igutex® TX3

Extremely wear-resistant



New #heavyduty

Endurance runner for the highest loads

igutex® TX3

Agricultural engineering and construction machinery require especially long service life and high operational reliability. igutex® TX3 is designed to be lubrication-free. It eliminates machine downtime caused by insufficient lubrication, reducing costs and benefiting the environment.

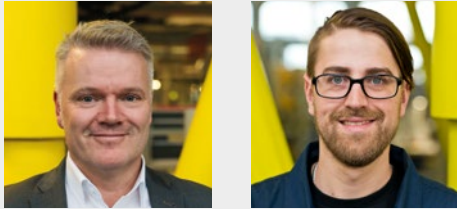
- ▲ Low wear rates in dry operation under extreme conditions
- ▼ No lubrication and maintenance
- Tested in the igus® plain bearing test laboratory at up to 100MPa and pivoting of 0.01m/s
- Long service life due to low wear; no additional lubrication required



From development

What we developed igutex® TX3 for

igutex® is an umbrella brand for an independent product series of fibre composites. igutex® TX3 is the new material igus® is introducing this year.



Uwe Sund (left), product manager for high-load plain bearings, and **Jens Forster (right)**, product developer, explain the new product line's features.

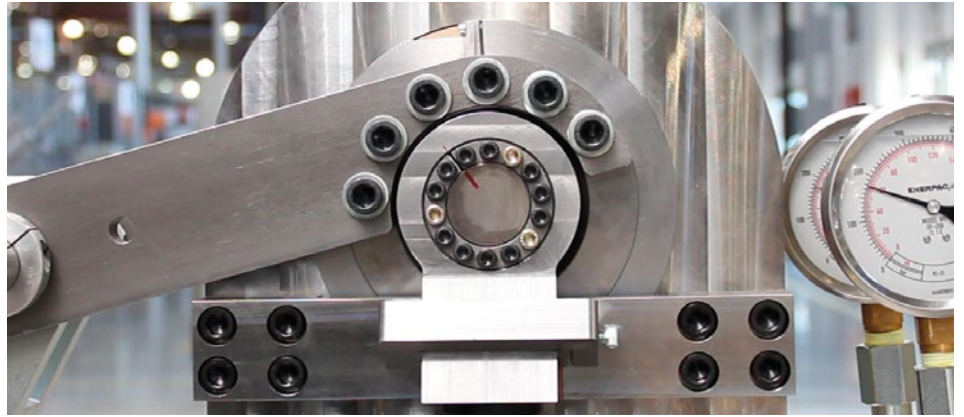
The majority of igus® plain bearings are manufactured using the plastic injection moulding process. Its foundation is thermoplastic base polymers supplemented by additives and fillers. The various components allow a wide range of properties and are evenly distributed over the entire component geometry. "iglidur® materials function very well under high loads, for example. A concrete application is iglidur® Q2 used in heavy cultivators for overload protection, where forces of more than 60MPa are the order of the day," says Sund.

But there are, of course, limits. "For very high surface pressures, pressures in excess of 80MPa, and certain types of force, the material structure does not exhibit sufficient mechanical stability. So far, for example, loads that rise and fall sharply at frequent intervals have presented us with major challenges. Such conditions literally shatter injection-moulded plain bearings."

"The special structure of fibre composite bushings offers a different approach here," says Jens Forster, who monitors the development of igutex® materials. "Extremely strong filaments are woven together to absorb the high loads. As

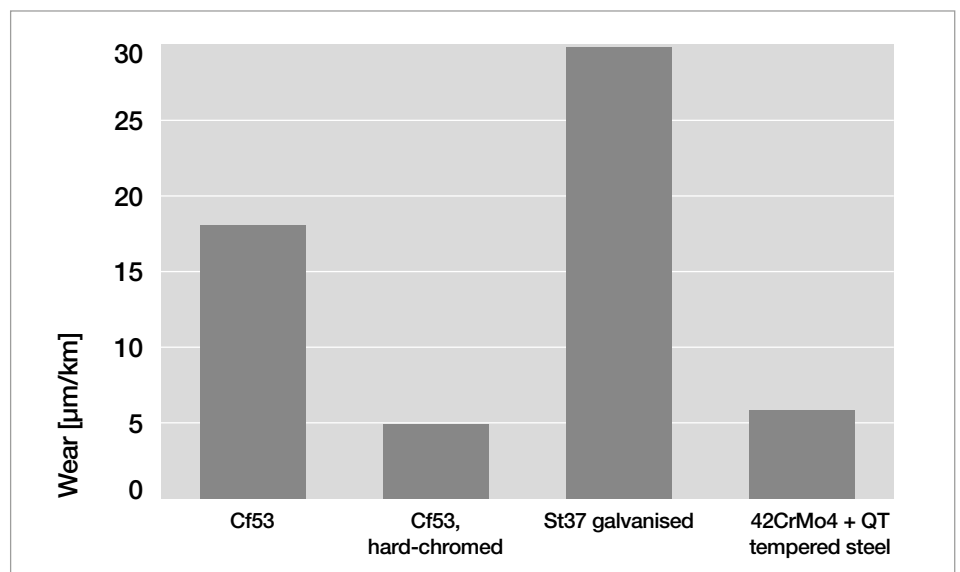
with our proven iglidur® materials, the process also allows solid lubricants to be embedded for lubrication-free operation that is easy on the shaft."

and opens up new fields of application. As with the thermoplastic iglidur® materials, which are compounds tailored to a wide variety of requirements, recipe changes to igutex® fibre composite technology



"The igutex® brand is intended to highlight this fibre composite bushing technology and underscore the various technical specifications," says Sund. "The higher the forces in an application, the longer the required service life, and the more shocks, impacts and alternating loads that are to be expected, the more likely it is that igutex® is the right choice. Where we see iglidur® materials reaching their limits due to the mechanical loads, we continue with igutex® fibre composite materials." The new igutex® TX3 material expands the previous range (igutex® TX1 and TX2)

can generate various properties. "We can also influence the shape and processing method for filaments and solid lubricants. This also results in different materials that are particularly well-suited to different requirements," says Forster. "We are convinced that igutex® TX3 not only is very resistant in applications with particularly high loads, such as those I mentioned that shatter the bearings, or extreme edge pressure, but also can deliver high running performance and therefore a particularly long service life," says Sund.



Wear rate of igutex® TX3 against different shaft materials, $p = 100\text{MPa}$; $v = 0.01\text{m/s}$

iglidur® Q3E

Extremely robust



New #exchange

New two-component heavy-duty plain bearings for large quantities

iglidur® Q3E

The excellent tribological properties of iglidur® Q3 are embedded in a high-strength jacket in this iglidur® multi-component bearing. The result is low wear combined with even higher resistance to mechanical loads.

- ▲ Suitable for use under extreme loads
- ▼ Cost-effective due to injection moulding
- Three times longer service life than igutex® TX1 at a load of 76MPa
- Lubrication-free dry operation eliminates the need for lubricants



Multi-layer plain bearing for high mechanical loads

In the world of heavy-duty applications for plain bearings, igus® achieves much better results with igutex® fibre composites than previously with iglidur® series injection-moulded plain bearings. But the limits of injection moulding technology have by no means been reached.



Stefan Loockmann-Rittich (left)
Head of the iglidur® bearings division

Lena Arnold (right)
M.Sc Material Developer
dry-tech® development

Even the most modern technologies cannot achieve the same strength values as high-strength fibre composites, but injection moulding does have the potential for more cost-effective solutions, especially for large quantities.

For this reason, igus® maintains a team of experienced materials technology and injection moulding tools specialists to research and develop solutions based on injection-moulded thermoplastics.

igidur® Q3E is the new igus® multi-layer plain bearing in which various specially optimised iglidur® materials are injected in the same tool operation and can later take on various tasks in the component. Says Stefan Loockmann-Rittich, head of the iglidur® bearings division, "The aim in developing Q3E was to present a two-part structure – tribologically optimised core, mechanically high-strength shell – similar to the one igutex® offers, but entirely injection moulded."

But what exactly is an iglidur® multi-component or multi-layer plain bearing?

"To answer this, I will first differentiate between our iglidur® and igutex® product groups," says Loockmann-Rittich. "The iglidur® materials are homogeneous materials processed in plastic injection moulding. They are differently balanced in their composition so that they can be used in a wide variety of areas and applications."

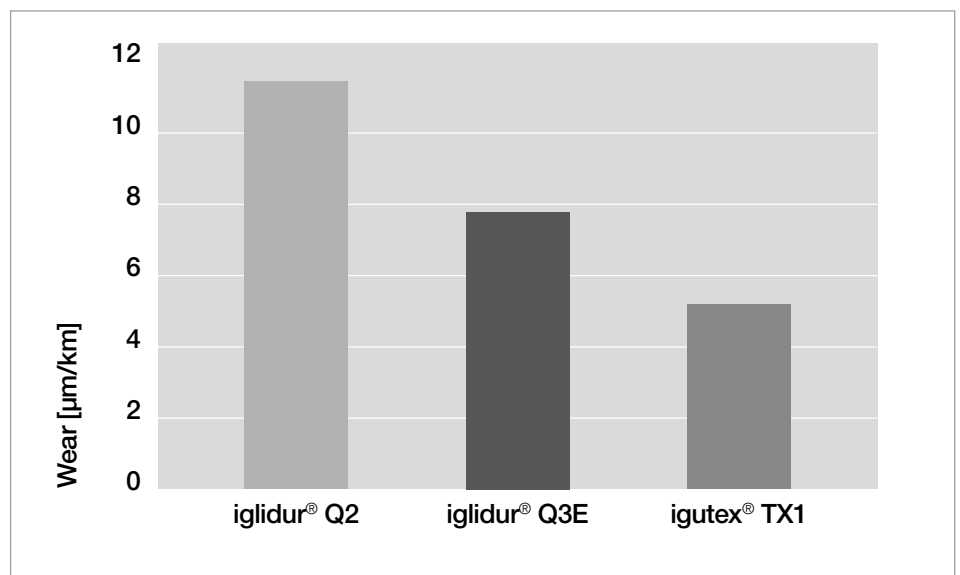
Starting at around 45MPa, mechanical strength of materials becomes increasingly important. igus® calls applications with these pressures "heavy-duty applications". Increasing loads in this area make it more and more challenging to optimise the material not only by enhancing mechanical strength, but also by adding tribological improvements or other attributes.

"The igutex® family of fibre composite materials largely decouples tribological properties from mechanical ones," says Loockmann-Rittich. "The plain bearings are built up in two layers in a winding process. The inner sliding layer ensures low coefficients of friction and low wear,

while the outer one provides great strength."

But the igutex® fibre composite bearing manufacturing process is much more time-consuming per unit than the iglidur® plain bearing injection moulding process. If the injection moulding tool is ready and adjusted correctly, bearings can be manufactured in a very short time. "The challenge here is connecting the two layers. This is done with the two-component injection moulding process with its complex, sophisticated injection moulding tools," says Lena Arnold, the project's lead product developer. "The two materials are processed together directly in one process and are literally fused together. We refined the component design and injection moulding tool for a long time, and we are very proud of the result."

Loockmann-Rittich adds, "The result is a perfect link between the homogeneous iglidur® materials and the wound igutex® fibre composite bearings for the 45MPa to 76MPa load range – one that is cost-effective thanks to injection moulding!"



Oscillating wear, p = 76MPa; v = 0.01 m/s; shaft = Cf53

iglidur® with integrated felt seal

100% safe from dirt



Study

Bearing points sealed and safe from dirt

iglidur® with integrated felt seal

The integrated felt seal protects the bearing point from dirt ingress. Ideal for 100% lubrication-free bearing points in dirty environments.

- ▲ 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



Sustainable and wear-resistant



New #recycling

Consists almost entirely (94%) of renewable resources

iglidur® N94

94% of the new iglidur® N94 plain bearing material is renewable. The material also offers the classic iglidur® advantages. It has been optimised for lubrication-free dry operation and allows precise calculation of service life in plain bearing applications.

- ▲ Wear-resistant and suitable for a large number of applications
- ▼ Reduces maintenance and lubrication costs
- Up to 50% better coefficient of friction compared to N54
- Uses renewable resources, reducing fossil resource consumption
- 🌸 Service life can be predicted with the iglidur® configurator: igus.eu/iglidur-expert



Coat components individually



Tribological polymer coating

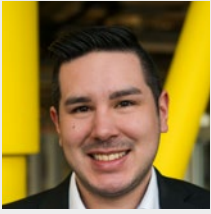
iglidur® coating service

Only three steps to find out price and delivery time for your individual coating. With our iglidur® coating service, you will get your configuration at the push of a button.

- ▲ Long service life due to wear-resistant surface
- ▼ Keep it simple: powder coating of electrically conductive components
- Up to ten times the wear resistance of PTFE coatings
- Long service life with good coefficient of wear
- 🔗 Online price and delivery time calculation: igus.eu/icd



Reduced wear and shortened throughput times for packaging machines



Marc Trenkler,
igidur® Coating
Product Manager
talks about a
customer
application.

Doel Engineering, a manufacturer of packaging and processing machines, has reduced frictional resistance, improved rigidity, shortened throughput times and increased hygiene standards on a series of machines by applying an iglidur® IC-05 tribo-coating to a sliding carriage.



The packaging machine takes bubble wrap and/or plastic tray pads from a roll, stretches and cuts them to size, and places them in trays. Originally, Doel Engineering used hollow rollers for this operation, but could not achieve sufficient tension in the material to make a fast, precise cut, so throughput times were too long. Inertia kept the rollers rotating after the system was switched off, which inevitably led to waiting times before the next cycle could begin, decreasing productivity. The previous rollers made of uncoated metallic material carried the potential risk of packaging material contamination even though the machine was regularly cleaned.

igus® analysed the process with production manager Adam Deighton and recommended replacing the rollers with

solid metal rods coated with iglidur® IC-05, an FDA-approved, tribologically optimised polymer in powder form. The coated rods had several advantages.

They were stiffer than the rollers previously used, allowing the machine to perform better while running smoother and faster with the new components. Start-up time approached zero, and the start/stop



process was instantaneous, so throughput increased. Like all iglidur® materials, iglidur® IC-05 coating powders are tribologically optimised, protecting the shaft from wear and ensuring excellent coefficients of friction and wear.

The thin coating (60-100 micrometres) is also FDA approved, meaning that it has been verified as "safe for the food industry" and poses no risk of contamination. It is manufactured in blue for better visibility. The IC-05 coating also means that no bare metal comes into contact with food, so the likelihood of oxidation for such goods as meat is reduced.



Advantages of iglidur® coatings



Long service life

Extend the service life of your application by reducing friction and wear with our plastic coating. The surface serves as a wear-resistant layer to protect your component.



Easy

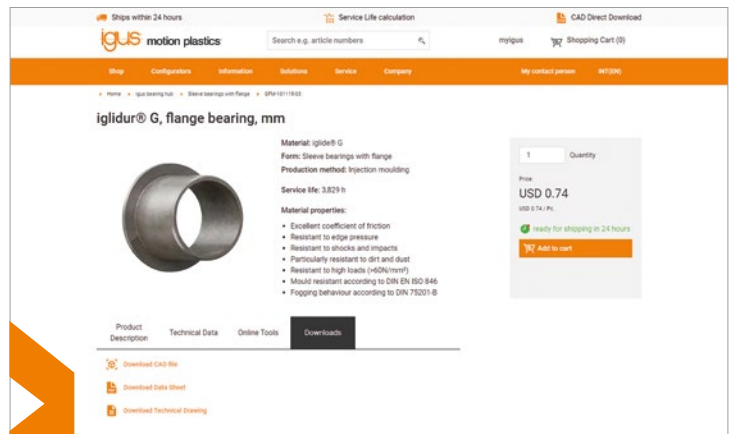
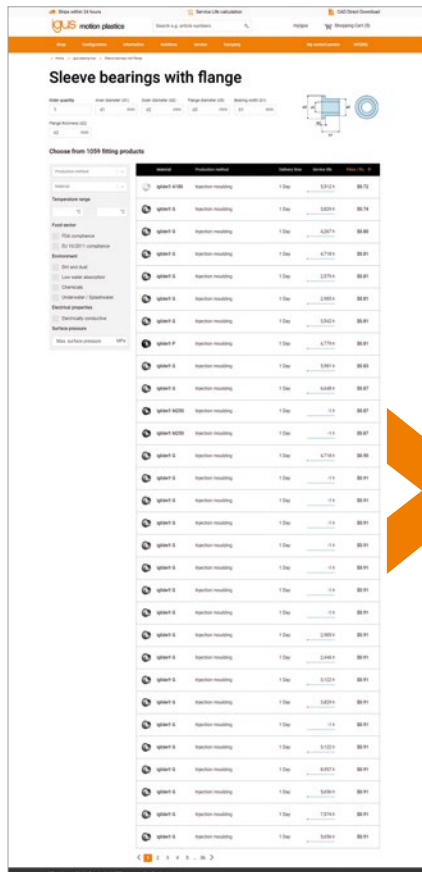
Reduce the complexity of your application by coating electrically conductive components with our powder coating. No additional component required.



Versatile

Our powder coatings are used in a wide variety of applications. For example, at high temperatures of up to 300°C or when in direct contact with food.

Find plain bearings easily



New

Digital merging of catalogue and special parts

iglidur® bearing hub

Who wants unnecessary custom-made products? The new iglidur® bearing hub is revolutionising online plain bearing procurement. You will receive a real-time overview of existing and similar catalogue components for the information you have provided and – if necessary – immediate prices for your custom-made products.

- ▲ Individually optimised or suitable standardised components at the touch of a button
- ▼ Reduces unnecessary costs for custom-made products by showing existing alternatives
- Find out for yourself: [igus.eu/iglidur-shop](https://www.igus.eu/iglidur-shop)
- Avoids resource consumption by making it easier to use identical parts
- 🌐 Uses digital services to optimise the procurement process

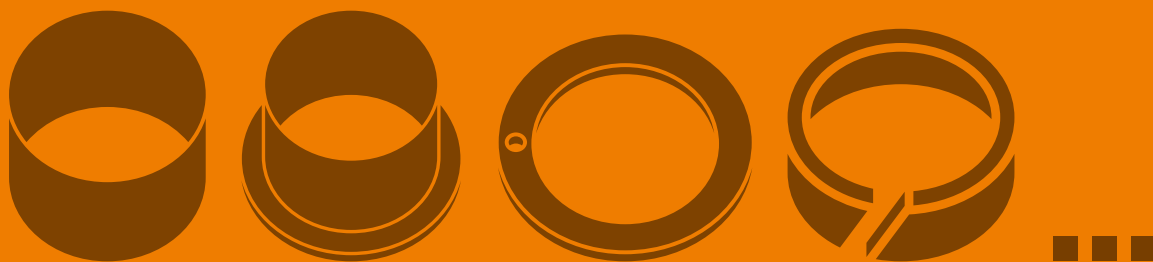




FastLine service

Receive individual injection-moulded plain bearings in seven days

The igus® FastLine service gives you customised injection-moulded plain bearings and thrust washers within seven days. The iglidur® Plain Bearing Designer immediately gives you a price and shows you the manufacturing costs for our other production methods. If the plain bearings you want are already available in our standard product range, they will also be included in the price comparison. This makes it easy for you to identify the best price.

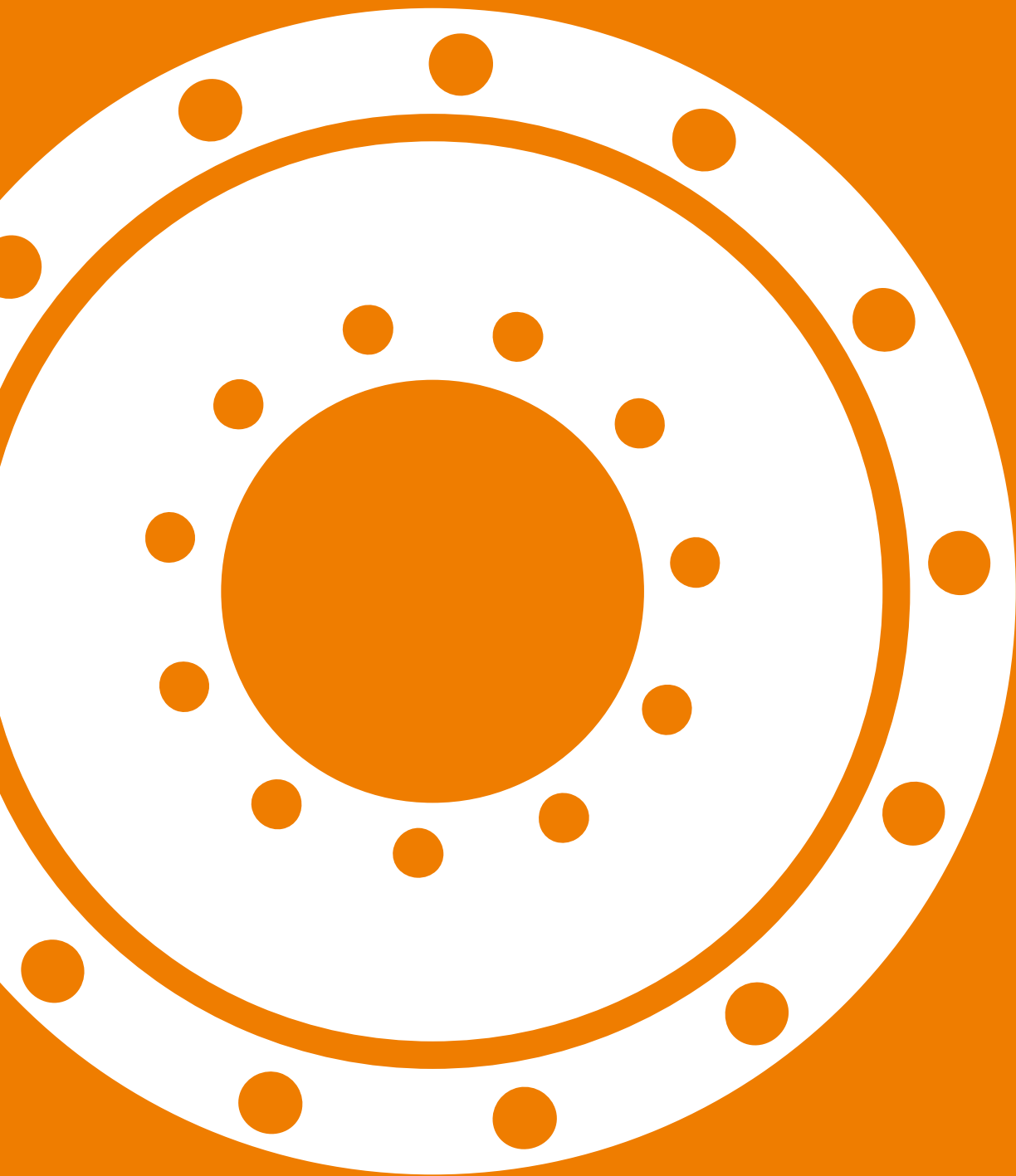


igus.eu/IBD

dry-tech® | Lubrication-free made easy ...

iglidur®

slewing rings



igus.eu/news-prt

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Tech up



Cost down



Proof



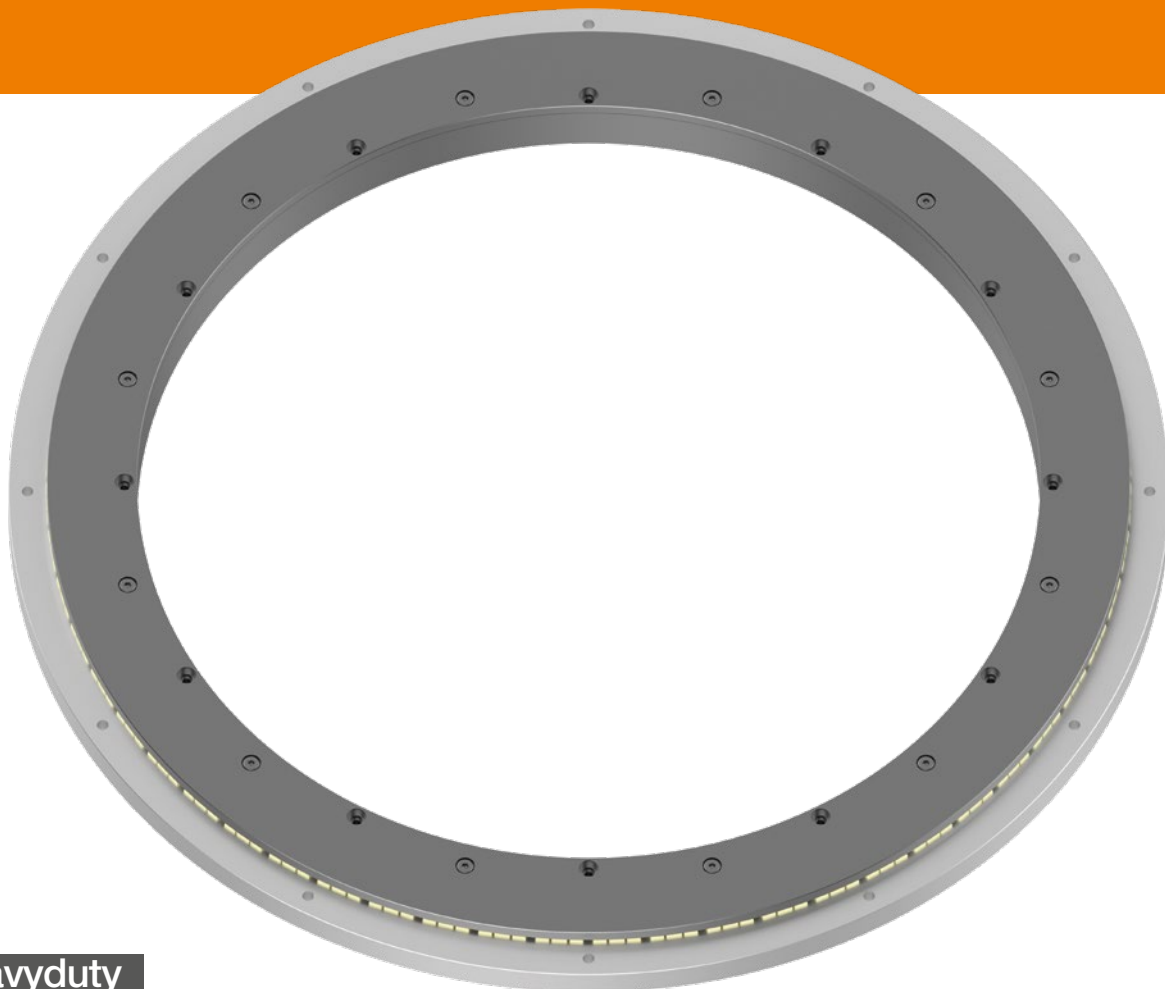
Sustainability



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Big and robust



New #heavyduty

Large slewing ring for high loads

iglidur® PRT-01-700

With our new PRT-01-700, static loads of up to 32 tons and tilting moments of up to 10,000Nm can be accommodated. It is therefore a perfect addition to our standard product range. The slewing ring comes as a ready-to-install solution and can be integrated directly into your application. Universal installation; it is insensitive to dust and dirt thanks to its lubrication-free sliding elements. The housing is made of lightweight anodised aluminium. Due to its high rigidity, it is perfectly suited for heavy-duty applications.

- ▲ For large installation spaces and high resilience
- ▼ Catalogue standard dimension 700mm inner diameter
- Static load up to 320,000N, maximum tilting moment 10,000Nm
- Ready-to-install solution with long service life



For large installation sizes



New

Sliding elements for tailor-made slewing rings

Universal sliding elements

With our universal sliding elements, we achieve excellent coefficients of friction and wear, even with high loads. Thanks to the flexible Z design, they can be used for individual sizes. Due to the crossbar connections, they can be adjusted to different diameters. They are also adjustable in height and can therefore meet different tolerances. Due to the symmetrical structure of the sliding elements, all load directions can be accommodated with just one component. The sliding elements are lubrication-free and maintenance-free and therefore perfectly suited for dry operation.

- ▲ Universal installation for large slewing rings
- ▼ Sliding elements are manufactured cost-effectively and are delivered ready to install
- Durable combination of materials, coefficient of friction $\mu = 0.15$, load capacity of an installed sliding element: axial static 6,000N, radial static 2,000N
- Lubrication and maintenance-free



Light and durable



New #superlowcost

Optimised slewing ring with a new design

iglidur® PRT-05-15-PC

Our iglidur® PRT-05-15-PC slewing ring consists of injection-moulded components that are inexpensive to manufacture and easy to assemble. The simple design ensures a light and strong construction. The materials used, iglidur® M260 and P4, consist of at least 97% regranulate and offer a durable combination of materials.

- ▲ Light design and strong
- ▼ Affordable solid plastic slewing ring
- Optimum combination of materials, coefficient of friction $\mu = 0.18$, axial tensile force 200N, axial compressive strength 1,750N
- Made from at least 97% regranulate



Cleanroom applications



New #cleanroom

The cleanroom PRT according to ISO14644-1 Class 3 / 4

iglidur® PRT-04-100-CR

Our iglidur® PRT-04-100-CR was specifically developed for the cleanroom. It offers the same technical specifications as the PRT-04-100 and also has lower particle emissions thanks to covering the outer rings. With the parameters 10kg load and 0.5m/s speed we get a result according to Class 3 and with a structure with a pivoting movement of 180° and 0.1m/s on Class 4.

- ▲ Low wear and low emissions
- ▼ Ready-to-install complete solution
- Tested and proven by the Fraunhofer Institute (ISO14644-1 Class 3 / 4)
- Maintenance-free and lubrication-free



iglidur® PRT-02-30-ECO

Sustainable performance



New #recycling

PRT slewing ring bearing made from at least 97% regranulate

iglidur® PRT-02-30-ECO

We use regranulates in our iglidur® PRT-02-30-ECO. These are sustainable because they are made from raw materials that have already been processed. The materials iglidur® P4 and iglidur® M260 were selected because they worked best together in the test and offer a long service life.

- ▲ Lubrication and maintenance-free
- ▼ Cost-effective, as it is made from at least 97% regranulate
- Coefficient of friction $\mu = 0.18$, static load 25,000N, maximum tilting moment 50Nm
- Made from our regranulates



Further highlights

iglidur® PRT slewing rings



PRT with position indicator



Study: Hygienic Design slewing ring bearing



PRT with manual clamp



Felt cover for PRT slewing ring bearing



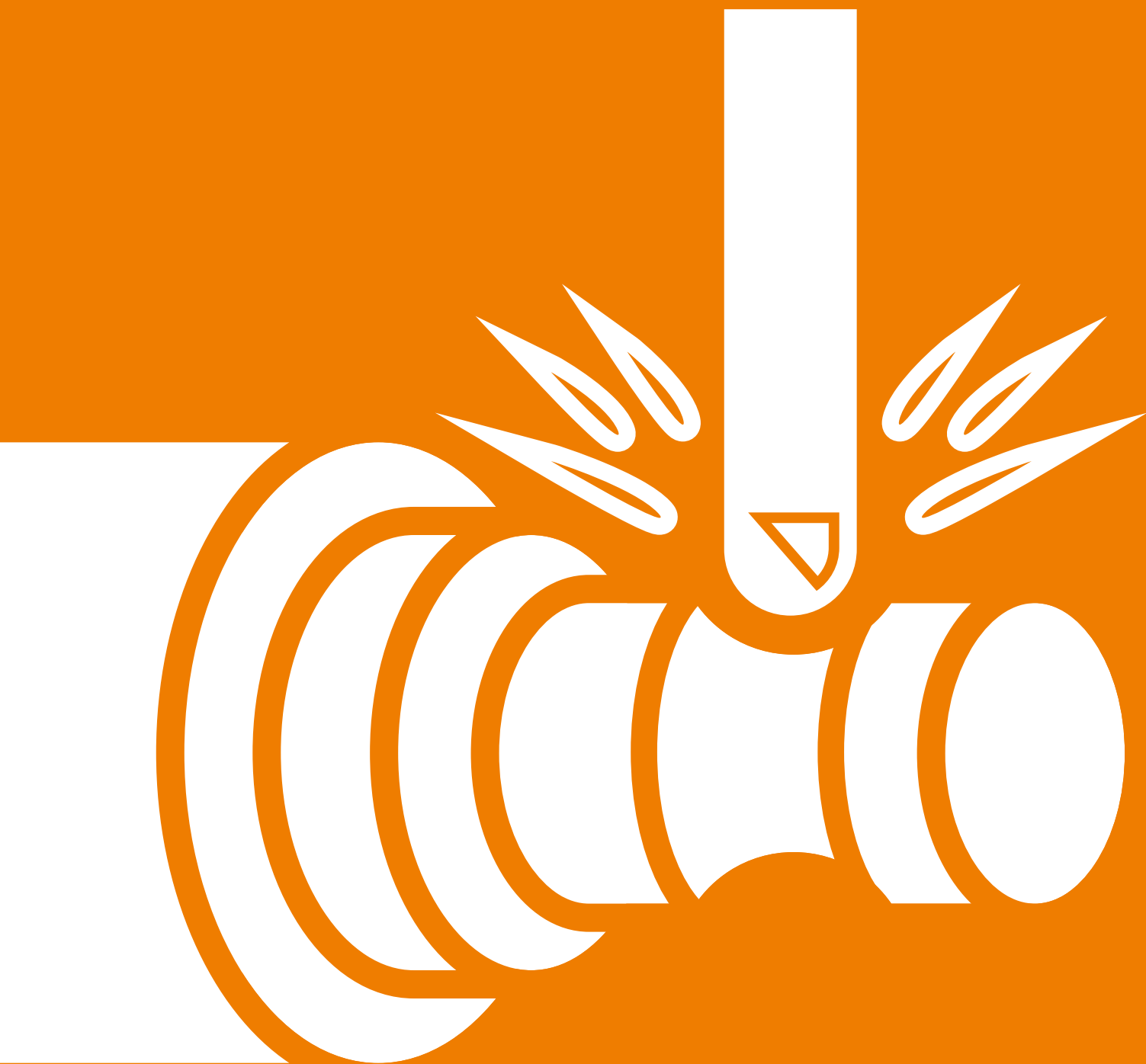
PRT-04 spacer ring made of aluminium



PRT-04 Micro Pre-Load

dry-tech® | Lubrication-free made easy ...

iglidur® bar stock



igus.eu/news-barstock

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Tech up



Cost down



Proof



Sustainability

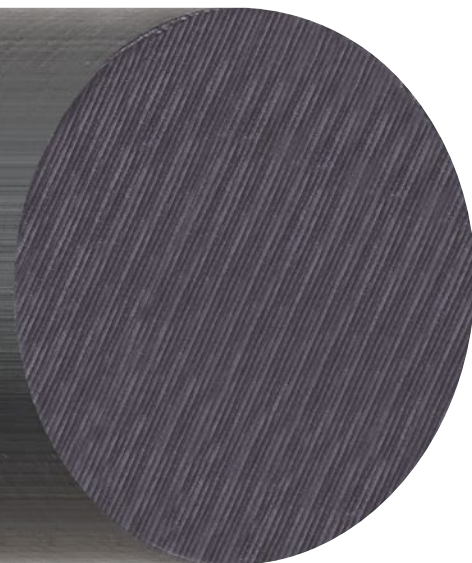


Digital

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iglidur® AX500 round bars

Electrically conductive



New #food

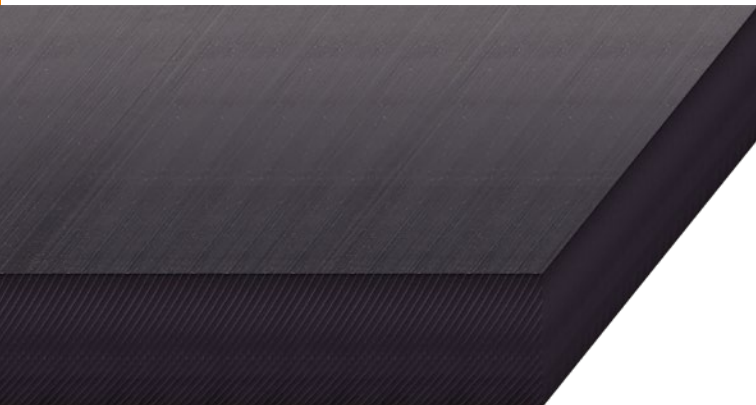
New food-grade material for the high-temperature range

iglidur® AX500 round bars

iglidur® AX500 is a conductive high-temperature material that was specially developed for the food industry. It can therefore be used in contact with food without any problems.

- ▲ Wear-resistant high-temperature material
- ▼ High running performance
- Reduction of the coefficient of friction by up to a factor of 3
- Environmentally friendly as no additional lubricants needed





Wear and media-resistant

igidur® B160 plate

igidur® B160 is characterised by extreme media resistance at a low cost. The tribologically optimised material can be used up to +90°C. The material is also characterised by extremely low moisture absorption.

- ▲ High media resistance
- ▼ Cost-effective
- Have been used as tribo-tape successfully for more than seven years
- Environmentally friendly as no additional lubricants needed



New #food

FDA- and EU10/2011-compliant for chemicals and food

igidur® A160 sheets

igidur® A160 is characterised by extreme media resistance at a low cost. Tribologically optimised, the material can be used in temperatures up to +90°C and also conforms to demands of the food processing sector. The profile of properties is completed by the "optical detectability", i.e. the blue colour, often required in the industry.

- ▲ FDA- and EU10/2011-compliant for chemicals and food
- ▼ Cost-effective
- Up to 4x longer service life in comparison to technical plastics
- Environmentally friendly as no additional lubricants needed





New #food

The FDA-compliant all-rounder

iglidur® A180 sheets

iglidur® A180 is suitable for application in direct contact with food. The material is the ideal solution for the food and packaging industries, the medical equipment manufacturing, for small equipment for households, etc. The iglidur® A180 distinguishes itself also in wet cleaning or where process-dependent contact with wet media is the business of the day by its extremely low humidity absorption.

- ▲ Complies with Food and Drug Administration (FDA) regulations for contact with food
- ▼ Cost-effective
- Up to 6x longer service life in comparison to technical plastics
- Environmentally friendly as no additional lubricants needed



New

Wear and media-resistant

iglidur® B160 round bars

iglidur® B160 is characterised by extreme media resistance at a low cost. The tribologically optimised material can be used up to +90°C. The material is also characterised by extremely low moisture absorption.

- ▲ High media resistance
- ▼ Cost-effective and wear-resistant and wear-resistant
- Have been used successfully as tribo-tape for more than seven years
- Environmentally friendly as no additional lubricants needed





New #food

Visually detectable endurance runner for high temperatures

igidur® AD500 plates

igidur® AD500 is approved for direct contact with food and has exceptionally good chemical resistance. Though iglidur® AD500 is a very soft material, it also possesses an excellent compressive strength even at high temperatures. The profile of properties is completed by the "optical detectability", i.e. the blue colour, often required in the industry.

- ▲ High-temperature material for the food sector
- ▼ High running performance
- Compliant with FDA and EU10/2011-regulation
- Environmentally friendly as no additional lubricants needed



Online CNC service 2.0

For individually machined parts made of iglidur® bar stock

Our „CNC Service 2.0“ enables fast order processing with just a few clicks. Simply upload a 3D model and you will receive transparent price information, including ... an automatic manufacturing feasibility analysis. In addition, you will also get an automated tolerance check from the technical drawing and an instant tolerances correction. An integrated service life prediction will also be available soon.

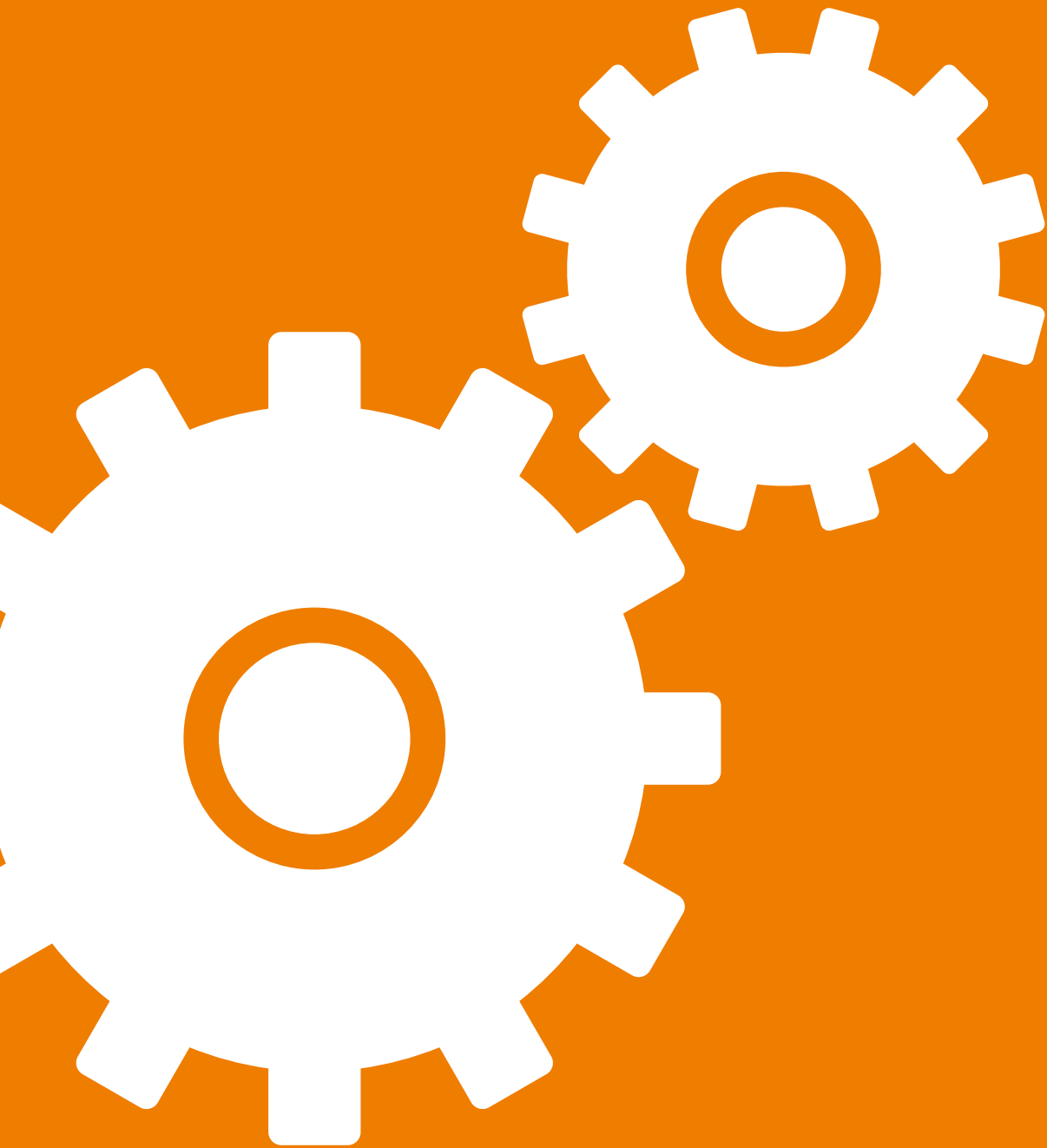
The screenshot shows the iglus online CNC service interface. On the left, there is a 3D model of a grey, T-shaped part. On the right, there is a form for setting material and quantity. The material type is set to 'igidur® X'. Below the form, there is a table with pricing information for different quantities and delivery options.

QTY	Standard	Express
1	€177.41	€266.12
5	€393.07	€589.61
10	€862.64	€993.96
50	€2,453.03	€3,679.55*
300	On request	On request

* Price subject to change

dry-tech® | Lubrication-free made easy ...

iglidur® gears



igus.eu/news-gears

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iguform S270 gear racks

Up to 1000mm with module 4



New

Up to five times lighter than metal

iguform S270 gear racks

The iguform S270 toothed racks are now also available in with up to a length of 1000mm in module 4 for ongoing assembly. Customer-rework or special geometries are possible for all sizes upon request.

- ▲ Low moisture absorption and suitable for lubrication-free applications
- ▼ Lower costs for maintenance, no costs for lubricants
- Up to five times lighter than metal racks
- Environmentally friendly as no additional lubricants needed





Customised rack lengths

xirodur® S180 rack and pinion elements

Long travel lengths with cost-effective rack and pinion elements and black anodised aluminium profile.

- ▲ Customised rail hole pattern possible
- ▼ Individual elements interchangeable instead of the entire rack
- Tested in the igus® laboratory: achieved service life of more than 2,000 hours (at 2.5Nm and a speed of 65rpm)
- Environmentally friendly as no additional lubricants needed



New #smallspace

"Small" is the new "Big"

Gears with module 0.2

From now on, custom-gears made from bar stock with tooth module from 0.2.

- ▲ For particular precise applications in small installation spaces
- ▼ Economically efficient also with small quantities
- Available for at least 4 materials that are successfully used for gears
- Environmentally friendly as no additional lubricants needed



iguform A270 gears

For the food industry



New #food

Over 300 dimensions for the food industry

iguform A270 gears

iguform A270 gears convince with a low coefficient of friction and a quiet operation. They also are FDA-compliant and can be used in wet areas.

- ▲ FDA- and EU10/2011 compliant
- ▼ Lower costs for maintenance, no costs for lubricants
- Compliant with FDA and EU10/2011-regulation
- Environmentally friendly as no additional lubricants needed



iguform S270 and igutek P360 gears with feather key groove

Complete systems



New

Gears with feather key groove according to DIN 6885-1

iguform S270 and igutek P360 gears with feather key groove

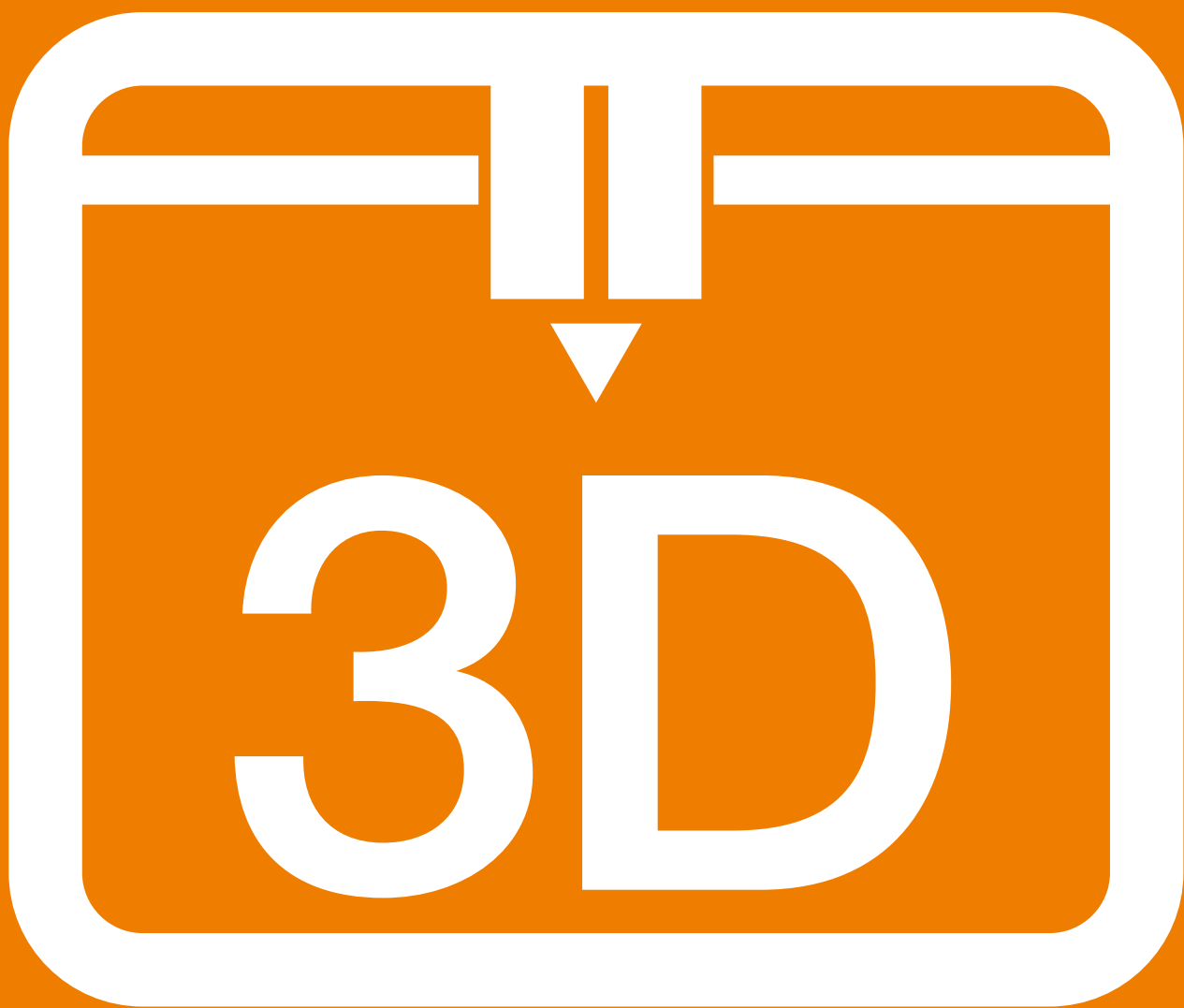
Our iguform S270 and igutek P360 gears are now also available with a feather key groove. The iguform S270 gears are characterised by low moisture absorption, the igutek P360 gears by high strength.

- ▲ Low moisture absorption and tough
- ▼ Cost-effective, available from stock
- Feather key groove manufactured according to DIN 6885-1 from shaft diameter Ø 6mm
- Environmentally friendly as no additional lubricants needed



dry-tech® | Lubrication-free made easy ...

iglidur® tribo 3D printing



igus.eu/news-3D-printing

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64 2kg-spool for more productivity in 3D printing
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Tech up



Cost down



Proof



Sustainability

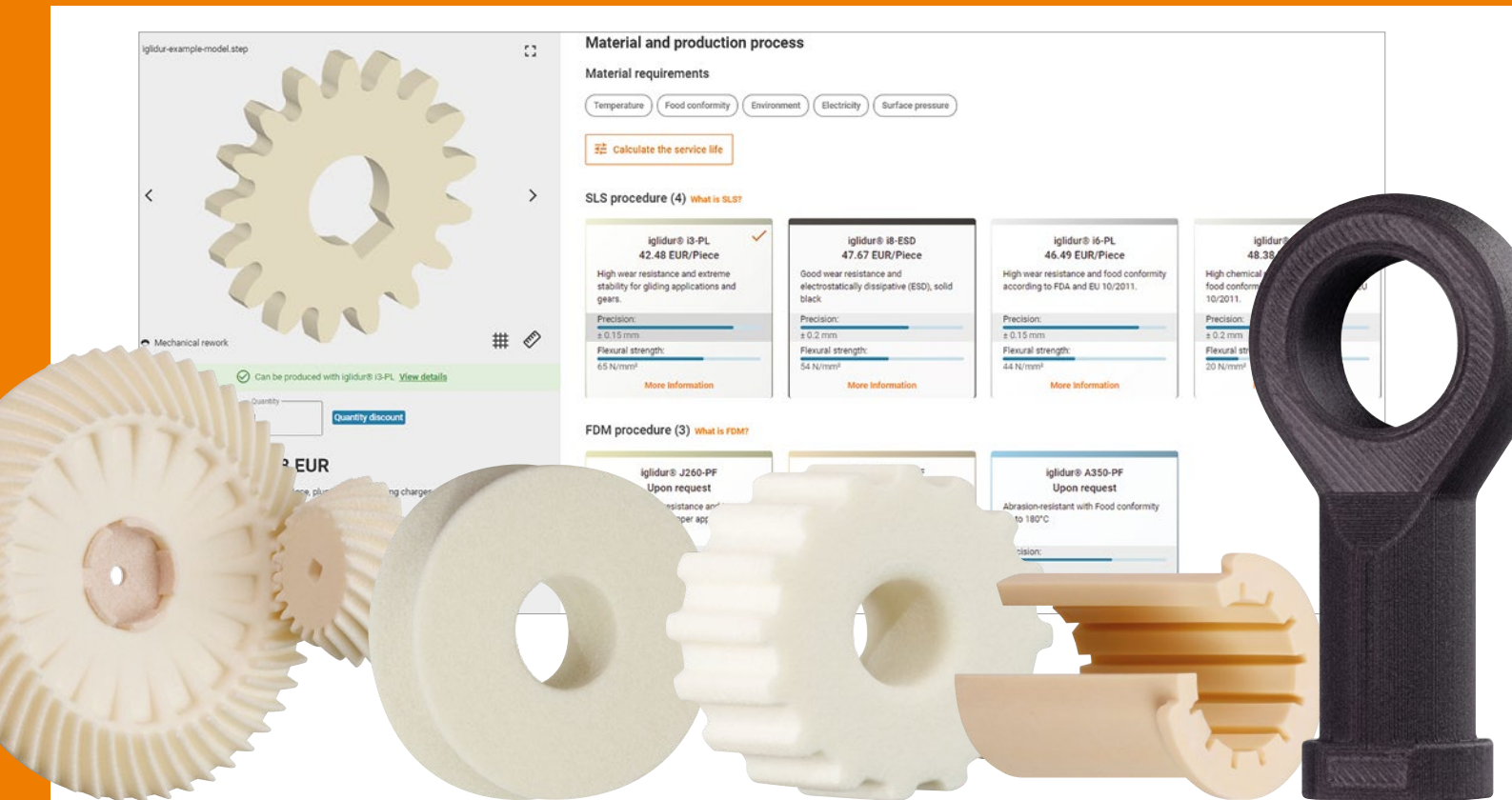


Digital

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Online 3D printing service 3.0 including service life calculation

One in all online tool



New

Simple and fast print of functional components

Online 3D printing service 3.0 including service life calculation

With the update of the 3D printing service tool, users can now get all the information they need regarding price, manufacturability and delivery time as well as material properties, expected service life and finishing of individual components easily in one tool.

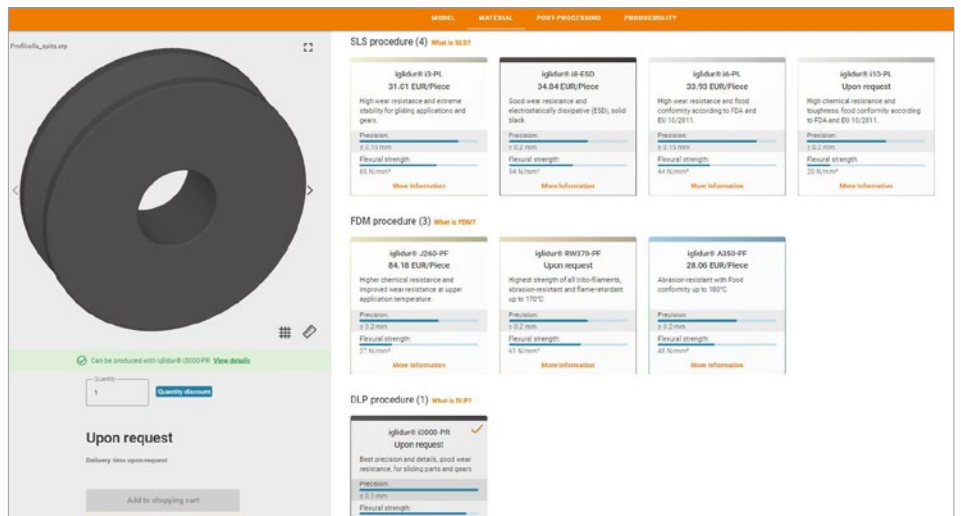
- ▲ Pricing, feasibility analysis, mechanical rework options and service life calculation - all in one online tool
- ▼ Simply find the most cost-effective solution that works
- We print any custom-component in 1-3 days
- 3D printing: low material requirements, since there is no waste or sprue
- 🎯 All in one online tool: igus.eu/idd



New materials, improved delivery time for rework and predictable service life

In just a few steps to your component with the igus® online 3D printing service: upload your CAD model and choose a manufacturing procedure and material - that's it. You will see the price and delivery time immediately and can then order the component or make an enquiry. The precise wall thickness analysis enables to predict the manufacturability and warns if the wall thickness is too small. For the print2mold® process, the undercuts are also checked.

For the DLP and FDM process, the actual support volume is measured for more accurate pricing. In order to avoid an unnecessarily early system failure, the expected service life of the component is also calculated for each material and displayed directly.



New materials and features can be ordered directly in the online 3D printing service:

- iglidur® i3000 resin in 3D printing service
- Components up to 1m made from iglidur® i150 in the large-format 3D printing service
- Components in print2mold® rapid tooling process including metal tool
- Predictable service life for all materials

Updates to post-processing and finishing options

1) Components can now be coloured even faster: 4 instead of 9 days delivery time

Components that were manufactured with laser sintering can be coloured. A surcharge will be applied. When colouring, dye infiltrates about 0.4mm deep into the component, changing the measurements only marginally. Colouring can reduce wear resistance by up to a factor of 3, depending on the application. The mechanical specifications remain almost unchanged. For colouring, the wall must be at least 1mm thick to ensure your component's stability and correct manufacture.

2) Mechanical rework can now be ordered directly online with prices

Components manufactured with the laser sintering process can be subsequently smoothed. For this, the methods of chemical smoothing and tumbling are available, a minimum wall thickness of 1mm is also necessary. With chemical smoothing, a chemical dissolves the typically rough surface of the components and seals them. In tumbling, the component is placed in a container with abrasives to smooth the surfaces.

igus.eu/idd

Further highlights iglidur® tribo 3D printing



Calculate the components service life for each material online

Service life calculator



SLS procedure (4) [What is SLS?](#)

iglidur® i3-PL
31.01 EUR/Piece

High wear resistance and extreme stability for gliding applications and gears.

Service life: 791,606 hours

Precision: ± 0.15 mm

Flexural strength: 65 N/mm²

[More Information](#)

FDM procedure (3) [What is FDM?](#)

iglidur® J260-PF
84.18 EUR/Piece

Higher chemical resistance and improved wear resistance at upper application temperature.

Service life: 2,950,180 hours

Precision: ± 0.2 mm

Flexural strength: 27 N/mm²

[More Information](#)

New

Simply find the most cost-effective solution that works

Calculate the components service life for each material online

With the new service life calculator integrated in the 3D printing service tool, you can determine the service life of individual components. Simply click on sliding surface and enter the parameters. The service life (in hours) will be displayed for each available material.

- ▲ Calculate the service life of potential individual 3D-printed components and find the right solution straight away
- ▼ Increase the reliability of the system with the component service life prediction
- 11,000 abrasion tests each year at 450 test rigs provide the service life calculator with data:
igus.eu/company-test-laboratory
- By calculating the service life, you can directly select the more durable material and avoid unnecessarily need for spare parts at an early stage
- With just a few clicks, calculate the estimated service life online and simply find the most cost-effective solution that works



Fine details



New #smallspace

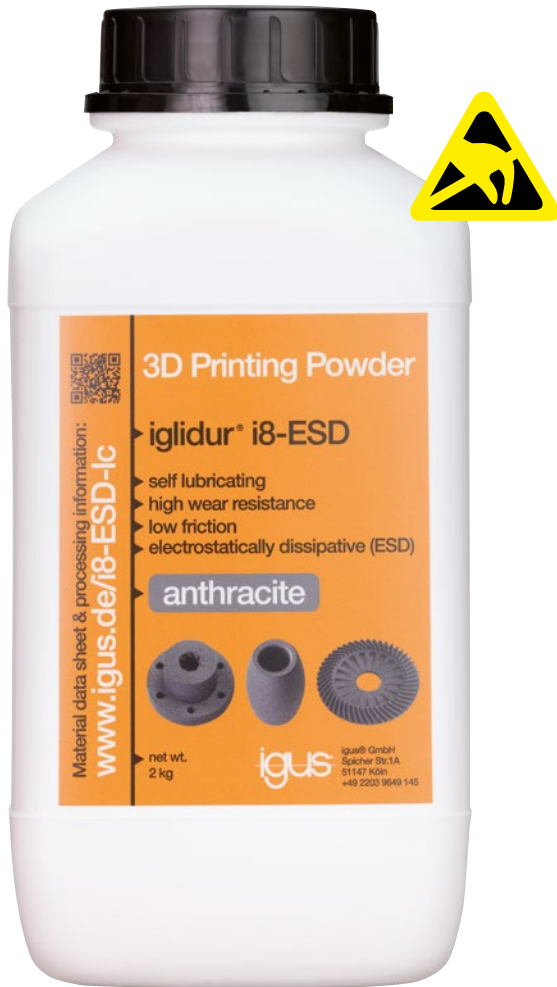
Thanks to an improved recipe, it is now even easier to process

iglidur® i3000 resin for DLP 3D printing

The world's first resin specifically for DLP 3D printing of wear-resistant parts and gears. For the finest details (precision: ± 0.1 mm, small gears from module $m = 0.2$) and long service life thanks to integrated solid lubricants and increased strength.

- ▲ Mechanical properties improved by 90%: flexural strength 90MPa and flexural modulus 2,610MPa
- ▼ No minimum order quantity, no tool set up costs
- Service life tests with eleven commercially available resins show that the service life of iglidur® i3000 is 30 to 60 times higher than that of conventional resins
- No lubrication required due to integrated solid lubricants
- Now also available in the online 3D printing service. Upload CAD files and order directly online: igus.eu/idd





New #superlowcost

ESD material for low-cost laser sintering systems

igidur® i8-ESD laser sintering powder in a 2kg-receptacle

igidur® i8-ESD is an electrostatically conductive SLS material for durable and abrasion-resistant 3D printed components. The powder is now also available in 2kg-receptacles for the process in low-cost systems.

- ▲ Electrostatically dissipative (ESD) material with high abrasion resistance
- ▼ Can be processed on low-cost laser sintering systems with and without CO₂ laser
- Laboratory report ESD properties: igus.eu/i8-ESD-test
Pivot test: twice as abrasion-resistant as PA12
- No lubrication required due to integrated solid lubricants
- 🔗 iglidur® i8-ESD also available in the online 3D printing service. Upload CAD files and order directly online: igus.eu/idd



New

For more productivity in 3D printing

igidur® i150 tribofilament® on a 2kg-spool

Our easy-to-process all-rounder filament iglidur® i150 is now available on a 2kg-spool. Spool changes are no longer necessary when printing particularly large or multiple components in one process.

- ▲ Increase productivity through fewer spool changes
- ▼ 10% cost savings compared to the smaller 750g-spool; less filament leftovers
- Multiple and larger components from one spool possible
- No component lubrication required due to integrated solid lubricants
- 🔗 Large-format printing with iglidur® i150 now also available in the online 3D printing service: igus.eu/idd



Sustainable cardboard spools

50% reduced CO₂ footprint



3D print filament on sustainable cardboard spool

After the changeover of the iglidur® tribofilament® i150, the tribofilaments® iglidur® i151, i180 and i180-BL are now also available in 750g-cardboard spool. Cardboard filament spools have a 50% lower CO₂ footprint than conventional polypropylene spools and are much easier for users to recycle.

igus.eu/ tribofilament



dry-tech® | Lubrication-free made easy ...

igubal® spherical bearings



igus.eu/news-igubal

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Tech up



Cost down



Proof



Sustainability

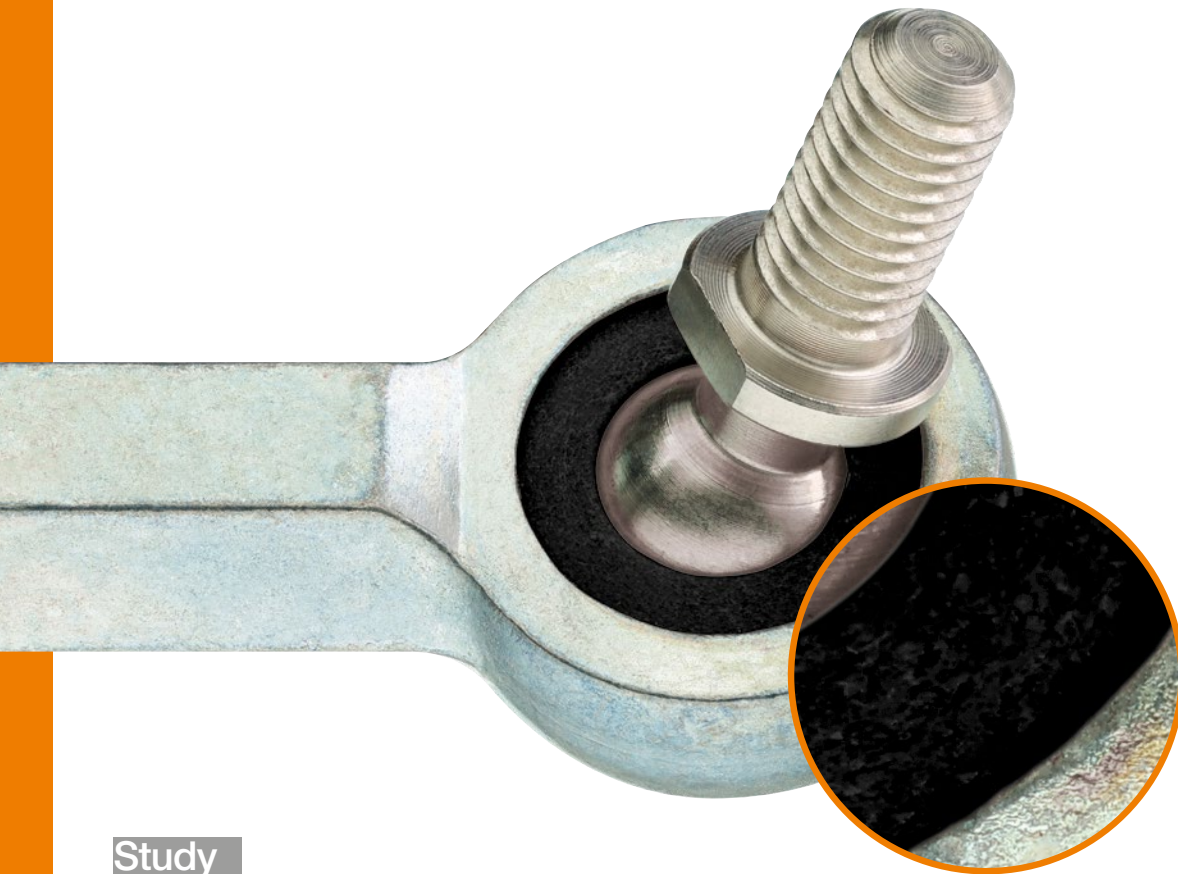


Digital

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Inner ring for high temperatures

Resistant up to +250°C



Study

Bearing support for ball studs and spherical balls

Inner ring for high temperatures

The temperature-resistant inner ring made of iglidur® X is very easy to assemble and can be combined in many ways.

- ▲ Misalignment compensation at high temperatures without deformation
- ▼ Elimination of need for maintenance saves costs for lubricants and maintenance work
- Stress tests in the igus® laboratory at temperature
- No additional lubricants necessary



From development

igubal® 2.0 inner ring for high temperatures

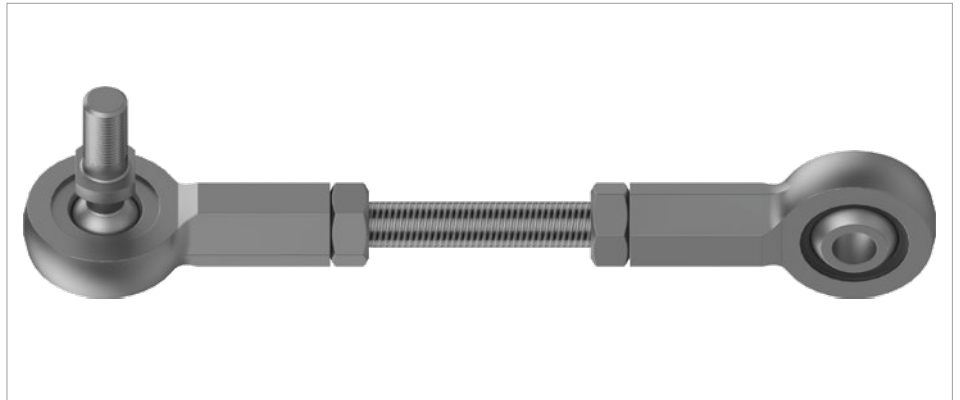
igus® is proud to present the new igubal® 2.0 inner ring. It is an extension of the proven iglidur® J and A181 inner rings, which are already being used successfully in many applications.

The iglidur® X inner ring was developed based on a customer request received by our igus® test laboratory. Our development engineer, Julian Lewerenz, headed up the tests and used graphs to clearly demonstrate the advantages of the iglidur® X inner ring over the J inner ring in terms of tensile strength at high temperatures.

The iglidur® X bearing ring is temperature-resistant and can be installed in a metal rod end housing in combination with a stainless steel spherical ball or a metal ball stud in order to compensate for misalignments. The bearing ring is designed to withstand constant temperatures of up to +250°C without melting or deforming.



Tensile test in the temperature chamber



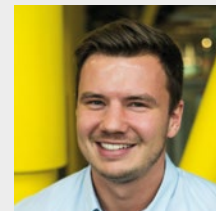
Combining it with a metallic housing gives it a much higher breaking strength than it would have with solid plastic housings, but the iglidur® inner ring still delivers the proven wear properties. The solid lubricants embedded in the material ensure maintenance-free operation without external lubrication or maintenance work. There is no more need for the special lubricants for the temperature ranges.

The iglidur® X inner ring was specifically developed for high temperatures. It expands our application options, and our customers can be sure that our products will work reliably even under demanding conditions.

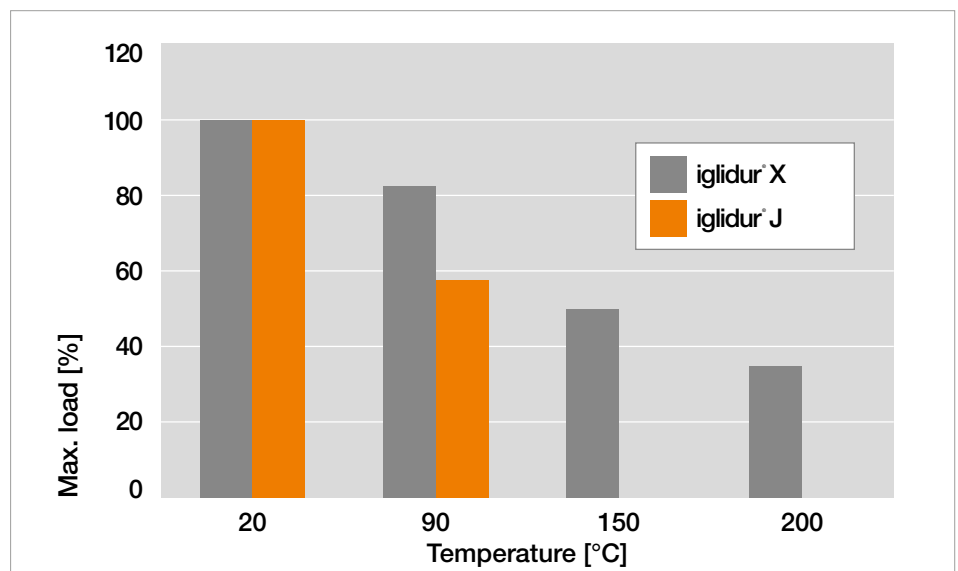
Temperature-resistant bearing rings are used in various industries such as the aerospace and automotive industries,

heavy industry, and power generation. Temperature-resistant bearing rings allow machines and systems to work safely and reliably even under extreme conditions.

Choosing the right igubal® bearing rings is an important step towards extending the service life of machines and devices and minimising downtimes.



M.Eng. Julian Lewerenz
Development Engineer igubal®



Resilience comparison: iglidur® X vs. iglidur® J



New

Metal housing provides high stability

igubal® 2.0 inner ring for ball studs

Also available with male thread in sizes M6 and M8.

- ▲ Connection for rotating and pivoting movements
- ▼ No minimum order quantity
- Coefficient of friction between inner ring and ball stud up to 0.08μ
- Environmentally friendly, no additional lubricants needed



New

The right coupling joint for every application

Crimped threaded inserts for adjustable coupling joints

Threaded units for crimping to create adjustable coupling joints. Combination of clevis joints and rod end bearings as well as angled and in-line ball and socket joint possible.

- ▲ Easy to assemble
- ▼ Customised lengths
- Up to 50% weight advantages compared to metallic solutions
- No lubrication necessary
- Configurable online via "Free Former"



Spherical ball for square profiles

New geometry



New

Square instead of round

Spherical ball for square profiles for our standard housings

igubal® pillow block bearings are especially easy to install. They compensate for misalignment and prevent edge pressure. Our pillow block bearings are now also available with spherical balls for square profiles.

- ▲ High radial loads
- ▼ Maintenance-free and lubrication-free
- Up to 15kN tensile strength (safety included)
- Environmentally friendly





New

Have fun in the sun

Split pillow block bearings for square profiles in solar trackers

Now available in more sizes. Dimensional range addition of proven ESQM pillow blocks bearings.

- ▲ Absorption of high static (wind) loads (up to 50kN)
- ▼ Lubrication-free, therefore no maintenance required
- Guaranteed service life of 25 years (72 years almost wear-free, simulated in the igus® laboratory at 1.5 tonnes)
- No environmental pollution from lubricants



New

We round out your bearings

Pillow block bearings for large shaft diameters in the solar industry

Spherical insert bearings for large diameters combined with proven pillow block bearing housings expand the selection of profile and shaft bearings.

- ▲ Misalignment compensation with spherical bearing shells
- ▼ Downtime reduction with maintenance-free bearing shells
- Long service life and high loads with a low product weight
- Environmentally friendly and eliminates costly maintenance by dispensing with additional lubricants





#food

New design for food applications

FC spherical bearing (Food Contact)

Great savings potential now also for cylindrical spherical bearings.

- ▲ FDA- and EU10/2011-compliant
- ▼ Longer service life
- Up to 10kN radial force absorption
- No lubricants necessary



New #exchange

Replace metal 1:1

Addition to the pillow block range

Plastic bearing housing for maintenance-free spherical insert bearings. Housing for two- and four-hole fixed flange bearings and pillow block bearing housings. Sizes UC209, 210, and 215, and size 208 for our PA pillow block bearing.

- ▲ Structurally optimised design
- ▼ Reduction of maintenance and downtime
- Over 15kN radial load possible (safety included)
- No lubrication necessary



igubal® Food Contact double joint

Food- compatible



New #food

Food Contact double joints are cost-effective, food compliant, and detectable

igubal® FC double joint

Our double joints are now available in food-compliant and detectable materials.

- ▲ FDA- and EU10/2011-compliant
- ▼ Costs much less than similar stainless steel designs
- See for yourself, ask for our free igubal® FC sample box: igus.eu/fc-sample-box
- No lubricants necessary



Quality you can touch with a new sample box for the expanded igubal® Food Contact spherical bearing system



Dennis Steffen
Product Manager igubal®

Try it yourself: new Food Contact sample box

If you need convincing of the advantages and the quality of the materials of igubal® FC spherical bearings before you buy, you can order a free sample box. The new box contains samples from all product areas: pillow block bearings, fixed flange bearings, rod ends, clevis joints and the new double joints. The entire spherical bearing system is characterised by a long service life and chemical resistance. This was proven by numerous tests in our own test laboratory. The igubal® FC also beats the conventional spherical plain bearings made of stainless steel in terms of costs. A cost advantage of up to 85% can be achieved compared to stainless-steel solutions. The igus product also requires less maintenance due to the self-lubricating specifications of the bearing material.

New igus® polymer double joint for direct food contact

Food manufacturers are faced with the challenge of constantly improving system reliability. Detecting the smallest impurities is a decisive safety factor for guaranteeing product purity. By integrating detectable additives that are also food-compliant into its high-performance plastics, igus® has developed a spherical bearing series specifically for direct food contact. It can be used to greatly reduce the risk of a costly recall. Detectors recognise even the smallest parts of components, facilitating quality assurance work. The materials are coloured blue to improve optical detectability as well. Food residue and mould spores can thus be quickly identified during cleaning checks.

More design freedom with the new double joint

"To give users even more design freedom in such a hygiene-sensitive area, we are now adding another component to our proven igubal® FC series. In addition to pillow block and fixed flange bearings, rod ends and clevis joints, the product range now also includes a double joint," explains Dennis Steffen, Product

Manager for igubal® Spherical Bearings at igus®. Like all igubal® FC products, it contains an optically and magnetically detectable housing made of the FDA-compliant igumid® FC material. The new spherical bearing is also lubrication-free and maintenance-free, vibration-dampening, corrosion-free and, in combination with a spherical ball, suitable for compensating for misalignments. "When selecting the right spherical ball, customers can choose between several materials, depending on their needs," says Steffen. "The insert made of the material iglidur® A181 can be used to comply with the strict FDA guidelines. The material iglidur® FC180 guarantees 100% detectability. Both also meet the EU 10/2011 standard for direct food contact.

If a higher tightening torque is required due to the spherical ball, customers can also choose a stainless-steel version." As with all igus® products, they work without external lubricants, which rules out contamination. In addition, cleaning processes can be carried out regardless of the bearings.

Solutions for the food industry



Order your free sample box with products and further information about our motion plastics® for the food industry.

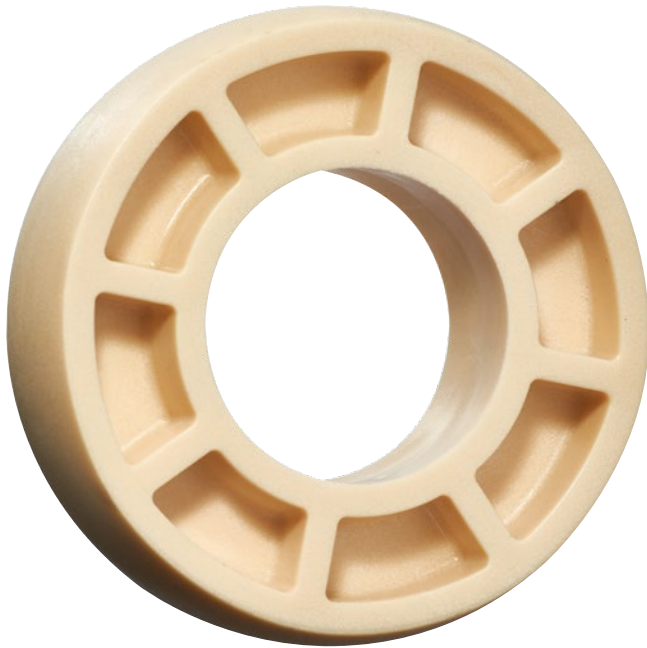
igus.eu/fc-sample-box

New #exchange

Three shaft diameters with only one housing

iglidur® J spherical insert bearing for UC208, new sizes

Our new JEM-35-21-80-SP spherical insert bearing size provides 1:1 interchangeability.



- ▲ Dimensions to equal to those of common flange bearings including in the bottling and packaging industry
- ▼ Less downtime and maintenance
- 18kN compressive force (safety included)
- Extreme weight reduction thanks to the polymer-friendly design



New

Easy protection

EC end cap for two-hole/ and four-hole fixed flange bearings

The igubal® EC end cap can protect against external influences when simply attached to two-hole and four-hole flange bearings. Available in custom colour.



- ▲ Easy assembly and disassembly (attached to the housing)
- ▼ Re-usable due to easy fitting mechanism
- Shore hardness D = 58
- Environmentally friendly, no additional lubricants



#exchange

Compact flanged housing

Two-hole and four-hole fixed flange bearings

Housing for shaft diameter 30, 35 and 40mm.

- ▲ Dimensions to equal to those of common flange bearings including in the bottling and packaging industry
- ▼ Completely corrosion-free
- Up to three times the service life with iglidur® J3 spherical insert bearings (-J3 or -J3-SP)
- More energy-efficient production method



Plastic housing – pillow block bearing



Polymer housing – four-hole fixed flange bearings



Polymer housing – two-hole fixed flange bearings



Fixed flange bearings with cost-effective metallic housing



Pillow block bearings with cost-effective metallic housing



Fixing collars (slotted on one side) made of plastic with press-fitted nut (20, 25, 30, 40, 50mm)

dry-tech® | Lubrication-free made easy ...

xiros® polymer ball bearings



igus.eu/news-xiros

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motion plastics® for quick replacement



Tech up



Cost down



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xiros® B180 ball bearing with J3 cage

Up to 21x longer service life



New

DIN sizes added to the product range

xiros® B180 ball bearing with J3 cage

iglidur® cage materials contain enhanced additives that improve stability and sliding properties. This results in longer service life.

- ▲ Service life improved by a factor of up to 21 compared to the current B210 standard product range
- ▼ Lower maintenance and operating costs thanks to a longer service life
- Tested in the xiros® laboratory (see report on the right-hand side)
- 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



From the test laboratory

Tested for friction and wear



M.Sc. Lena Wölke-Glomb, Material Developer xiros®

High speeds lead to high centrifugal forces of the balls. This accelerates the balls outwards. The cage material requires a certain stability, cage pockets would otherwise expand, giving the balls more clearance and freedom of movement. If the balls can no longer maintain the correct position, there is more wear and the bearing fails sooner than

expected. We use reinforcing materials to increase cage material stability, and there is sliding friction between the balls and the cage. Solid lubricants improve sliding performance. That is why we use iglidur® materials for cages. They contain additives that improve stability and sliding properties.



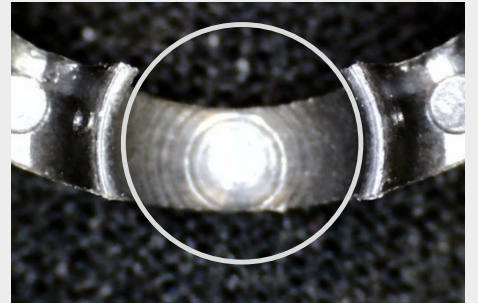
Effect of cage material on ball bearing wear. Tested in the igus® laboratory



Unreinforced material, before the test



Unreinforced material, after the test



Reinforced material, before the test



Reinforced material, after the test

xiros® A500 ball bearing with xirodur® F500 cage

New cage material



New

Up to 50% longer service life

xiros® A500 ball bearing with xirodur® F500 cage

The xiros® A500 ball bearings withstand continuous operating temperatures of up to +150°C and are ideal for use in the semiconductor and chemical industries.

- ▲ Reinforced cage material for up to 50% longer service life compared to similar A500 ball bearing cages
- ▼ Significantly reduced maintenance intervals
- Laboratory test confirms: F500 cage with only 35µm wear compared to A500 cage with 150µm wear at 500rpm and a load of 5N (operating time of four days)
- 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



xiros® A500 ball bearing with ceramic balls

New ball material



New

Good wear resistance and wide product range

xiros® A500 ball bearing with ceramic balls

Due to their ceramic balls made of zirconium oxide, the new A500 ball bearings are the ideal high-temperature bearing solution in the semiconductor and chemical industries.

- ▲ High chemical and thermal resistance of zirconium oxide
- ▼ Avoid bearing damage and follow-up costs
- 8% less wear compared to ball bearings with glass balls (laboratory test: 110µm ceramics to 120µm glass at 500rpm and a load of 25N, operating time of five days)
- 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



xiros® roller guides

Lowest rolling friction



New #exchange

The alternative to cross roller guides

xiros® roller guides

Our new roller guides are lubrication-free and low-friction. They are perfect for linear laser adjustments as well as the optical industry.

- ▲ Lubrication-free and extremely slim design
- ▼ Cost savings of up to 60% compared to conventional cross roller guides
- Five million test cycles (full stroke length) successfully tested at the customer's site
- 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



New #recycling

Environmentally friendly rotation

The ECO ball bearing in green

Instead of disposing disused plastic, such as sprue from injection moulding production, we give it a new life - resulting in an ECO ball bearing all-rounder.

- ▲ High media resistance and low moisture absorption
- ▼ Cost-effective due to reuse of raw materials
- Wear less than 40µm at 1,000rpm and a load of 50N (operating time of two weeks)
- 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/hydrops



Further highlights

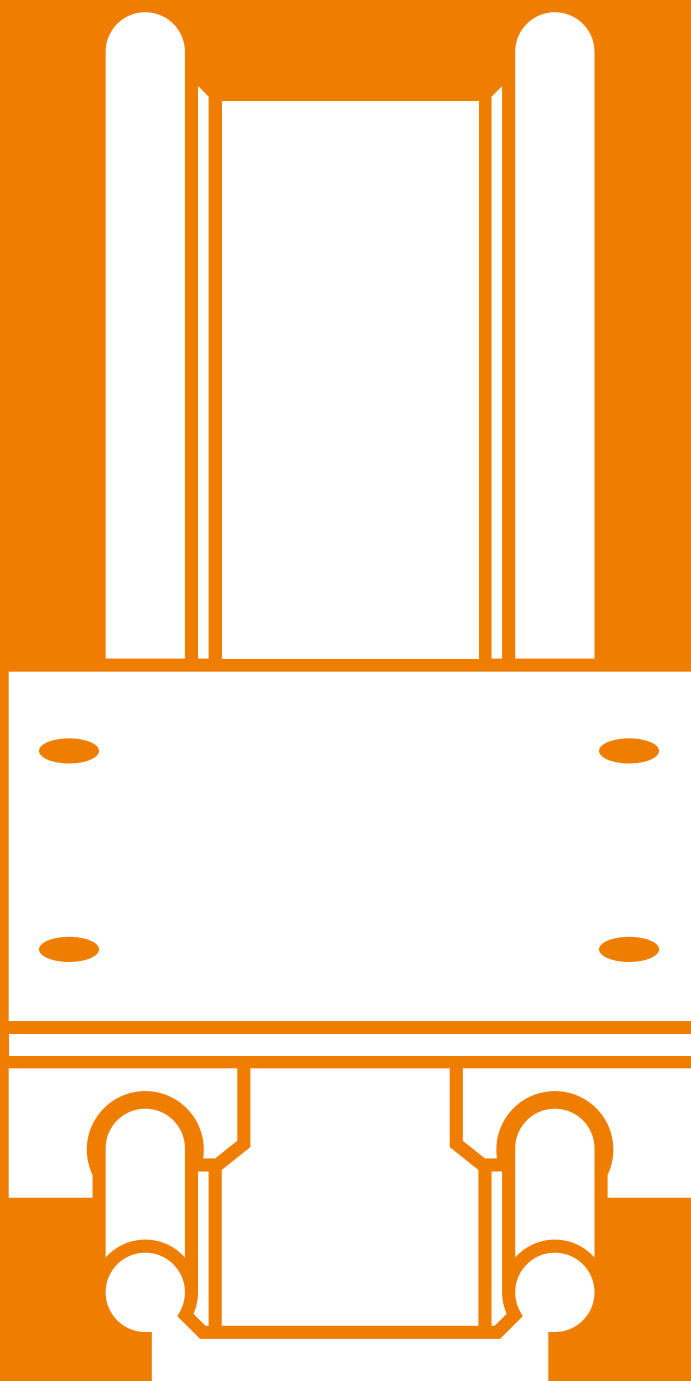
xiros® polymer ball bearings



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drylin®

linear technology



igus.eu/news-drylin-linear

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| <p>18 #heavyduty
motion plastics® for high loads</p> | <p>24 #exchange
motion plastics® for quick replacement</p> |
| <p>20 #smallspace
space-saving motion plastics®</p> | <p>25 #food
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Tech up



Cost down



Proof



Sustainable



Digital

drylin® W linear carriage

Identical dimensions



#exchange

Simply change to linear guide systems

drylin® W linear carriage

Linear guide system: switching is becoming easier thanks to drylin® W linear carriages with identical dimensions as recirculating ball bearing guides.

- ▲ Dimensions identical to those of recirculating ball bearing guides (installation sizes 15 and 20)
- ▼ Suitable for drylin® standard rails
- Test in horizontal installation position, rail length 1,000mm, load 250N, centric drive and centre of gravity, acceleration 10m/s^2 , running performance in 24/h operation: 2,500km
- Reusable carriage body due to exchangeable liners



drylin® W instead of recirculating ball bearings

Quick technology switch - take the dryway®

This linear carriage has the same mounting dimensions as common recirculating ball bearing carriages.

With the drylin® W linear carriage T15 from igus®, you benefit from a reliable and durable linear guide that does not require lubrication or maintenance. Because with drylin® linear guides you will reach your goal quickly and efficiently - whether slowly, quickly or quietly.

The new drylin® linear carriage T15 offers you an easy way to switch from lubricated recirculating ball bearing systems to a lubrication-free and maintenance-free linear technology. The mounting dimensions of the linear carriage and the linear rail correspond to those of common recirculating ball bearing systems in size 15.

You also benefit from the variety of drylin® linear rails, such as aluminium profiles with different coatings, high profiles for unsupported applications or slider profiles with suitable threads.

The heart of the drylin® linear carriage T15 are four drylin® liners made of lubrication-free igus® polymers, which guarantee a long service life for every application. In addition, the liners are available in different materials to meet the needs of different industries, including food and pharmaceutical compliance, chemical and temperature resistance.

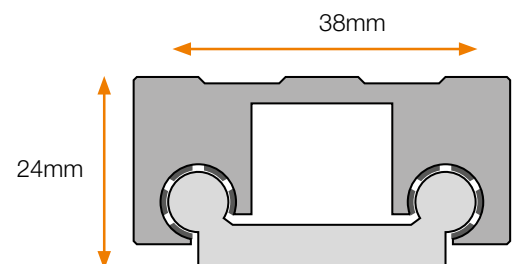
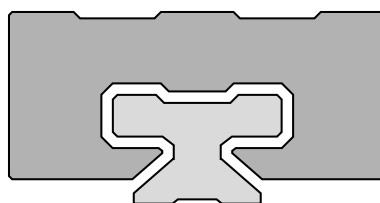
The type of the T15 is extremely compact in terms of dimensions, so that it can also be used in narrow installation spaces. You can choose the base body of the carriage from two versions. Lightweight, anodised aluminium and corrosion-free in the stainless steel version for use in demanding, robust and cleaning-intensive environments.

The study by our drylin® product developer Mira Heiligenhaus on the subject of hygienic design for drylin® W linear carriages and rails shows other exciting developments for this installation size.

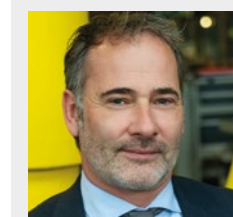
With drylin® linear guides, you stay on the direct path to your goal, without unplanned stops or trips for maintenance and lubrication. They are extremely insensitive in dirty and dusty environments and extremely durable for indoor and outdoor use. Compared to recirculating ball bearing systems, drylin® linear guides offer a clean, sliding alternative.



Benefit from the advantages of the drylin® W linear technology and follow us on the dryway®.



Mounting dimensions: drilling pattern on the carriage 30mm, system height 24mm, drilling pattern on the rail 38mm



Stefan Niermann

Head of Business Unit drylin®

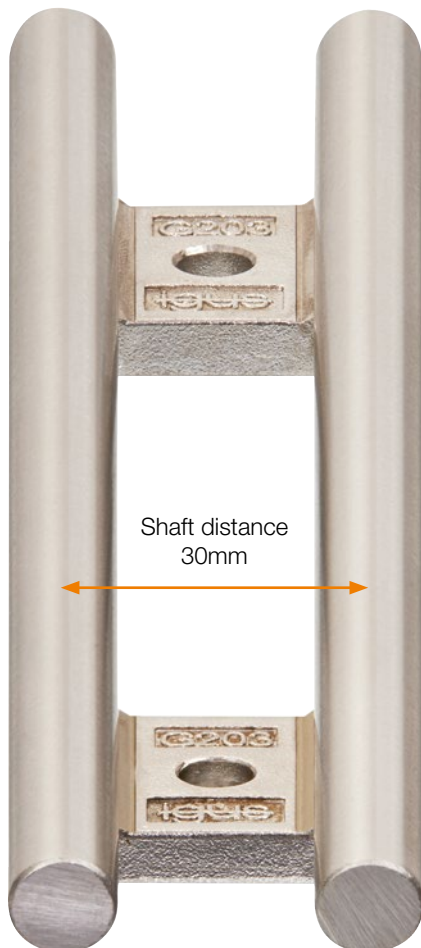
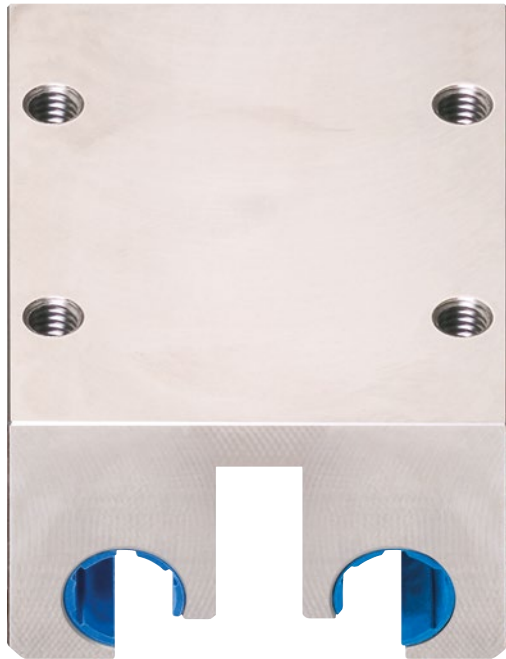
#exchange

Change to stainless steel linear guide systems

drylin® W linear carriage

drylin® W linear carriages simplify the change from recirculating ball bearing systems to a guide system. Now for the first time in areas where stainless steel is required.

- ▲ Easy installation due to monobloc
- ▼ Suitable for drylin® W stainless steel rails WS-10-40-ES-FG/WS-10-30-ES
- Test setup vertical installation position, centric drive/load, load 100N, speed 0.3m/s, running performance: 2,500km
- Maintenance-free thanks to FDA/EU-compliant igus® polymer A160



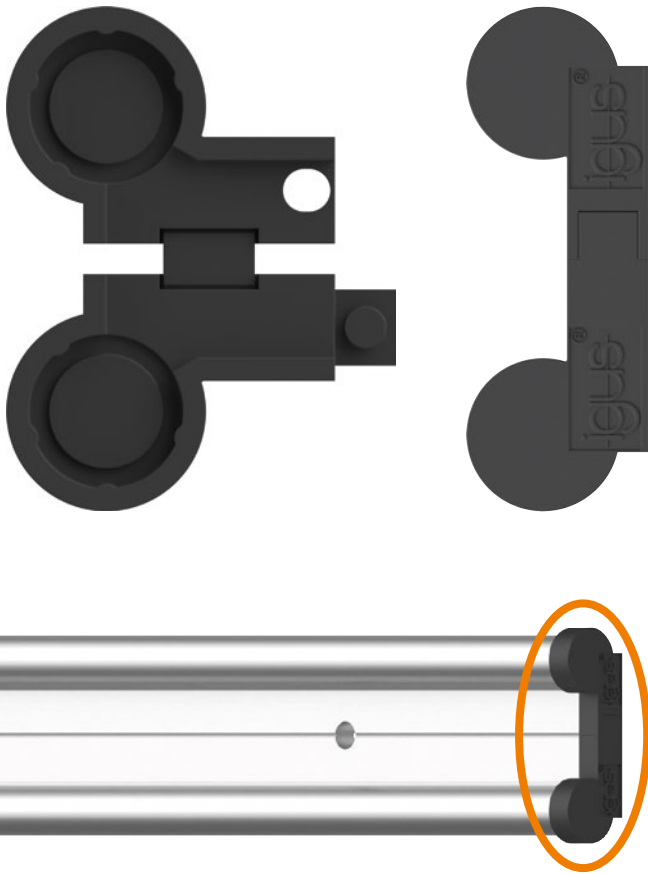
Corrosion-free stainless steel

drylin® W double rail made of stainless steel

Areas where stainless steel is required by legal regulations as well as resistance to corrosion and media.

- ▲ Stainless steel rail profile also available in installation sizes 10-30
- ▼ Simple cleaning processes
- Round shafts made of AISI 316Ti for maximum resistance (temperature/water/chemicals)
- Corrosion-resistant





New

Edge protection for drylin® W rails

End caps for all double rails Ø 10mm

In addition to the covers for drylin® W rails, there are now end caps for all installation size 10 drylin® W double rails.

- ▲ Two-piece construction for safe edge protection
- ▼ Quick assembly without tools
- Rounded edge protection geometry for securing the carriage
- Can be disassembled and reused



New

Clamping directly on the carriage

drylin® T TW-12 Performance linear carriages

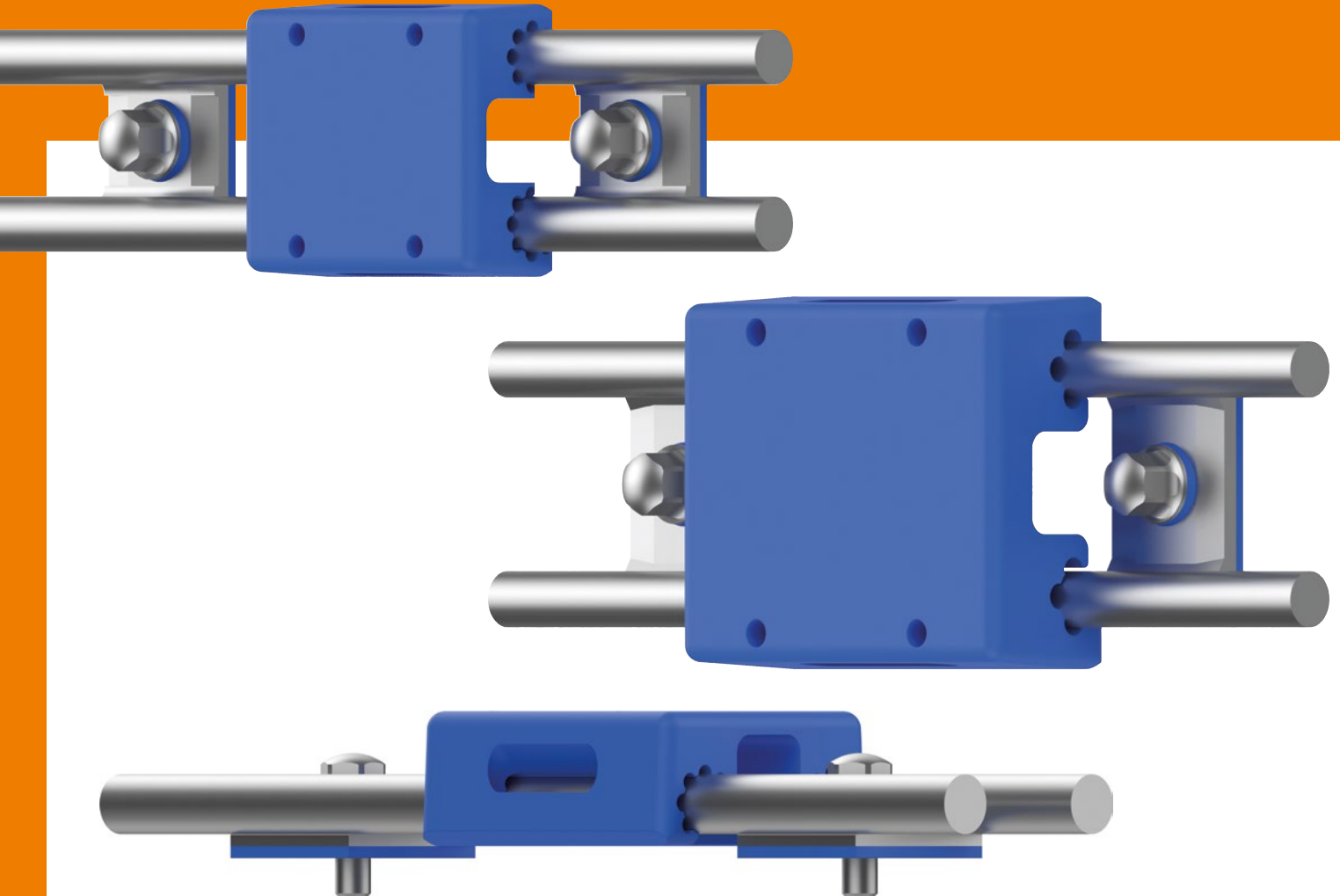
drylin® T linear carriages in four sizes with integrated manual clamp. The clearance adjustment is made directly on the carriage.

- ▲ Longer service life with iglidur® J200 slider
- ▼ Ready-to-install system
- Tested. drylin® TW-12-15: 2 rails, 2 carriages with fixed/floating bearing, 75N load, drive/centre of gravity middle travel distance without changing bearings: 35,000km
- No external lubrication
- 🌀 Predictable function/service life online



drylin® W replaces recirculating ball bearings

Hygienic design



Study #food

Bacteria and germs don't stand a chance

drylin® W linear carriage in hygienic design

The new hygienic design study is a clean system with FDA/EU10/2011-compliant components. It has the same dimensions as recirculating ball bearing guides and is very easy to clean.

- ▲ Linear guide for efficient cleaning processes
- ▼ Hygienic design of all components
- Linear carriage or liners made from FDA/EU-compliant iglidur® A160
- 100% dispense with any kind of lubrication



Easy cleaning of moving parts - without enclosure

drylin® product developer Mira Heiligenhaus in an interview

How did the "drylin® W and Hygienic Design" study come about?

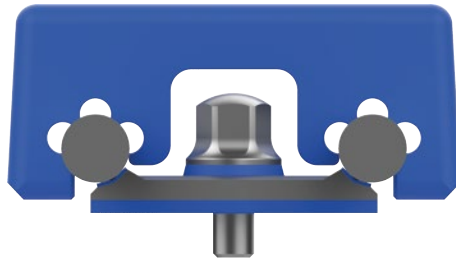
We developed the new carriage type T15/T20 for drylin® W, and a customer wanted an optimised design in accordance with hygienic design principles (according to EHEDG Guidelines Doc. 8) in addition to the same dimensions as the recirculating ball system. Therefore I am in touch with Dr. Jürgen Hofmann, who is the contact person and certification officer of the EHEDG in Germany. The focus of such certification is easy cleaning of components that are used in the food sector. Certification is currently still a challenge, as moving parts such as linear guides do not have a gap-free design due to their function and therefore do not meet existing design requirements. We wanted to gain a solution together with our customers. What is important for the product is the acceptance of the rinsable carriage, since such a solution has not yet existed on the market. So far, most hygienic design solutions have been based on a complete enclosure. An example of this is our PRT design study from last year.

igus.eu/prt-hygienic-design

Which topics are in focus?

First of all, the use of suitable materials, therefore we use the FDA- and EU-compliant igus® high-performance

polymer iglidur® A160. Also corrosion-free 316 stainless steel (AISI 316Ti) and FDA-compliant sealing material. In addition, the hygienic design adjustments for quick, easy and efficient cleaning as well as stainless steel surfaces with $Ra \leq 0.8\mu m$ to avoid microscopic surface structures, a high surface quality that prevents dirt from sticking, hygienic fastenings and much more.



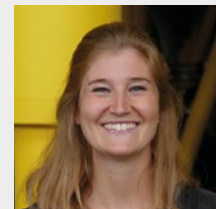
What design features have been implemented?

The carriage is suitable for easy cleaning thanks to large flushing grooves on the side and on the bearing surface. Bevelled edges allow cleaning agents to run off quickly. The bottom seal protects the space under the rail from dirt accumulation and no residues of food and chemicals can settle. For the same reason, there is sealing of the shafts to protect gaps from debris. Sealing can also be achieved by circumferential welding or soldered seams - as is the case with the smaller carriages. The

fastening of the system is also special - hygienic screws with seals hold the stainless steel rails in place.

What does drylin® linear technology present in 2023?

A first FDA-compliant linear carriage T15 made of the igus® polymer iglidur® A160 according to hygienic design, corrosion-free linear rails with suitable sealing for the support elements or completely welded for gap sealing.

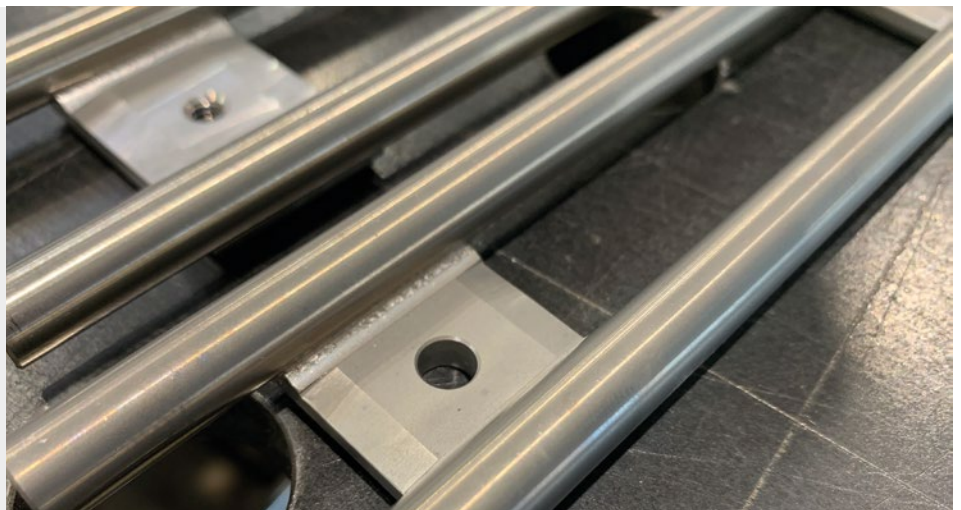


Mira Heiligenhaus
drylin® Product Developer

The support elements are soldered to nickel using the inert gas soldering process. The hard and high-temperature soldering process under protective gas enables a solid, material connection.

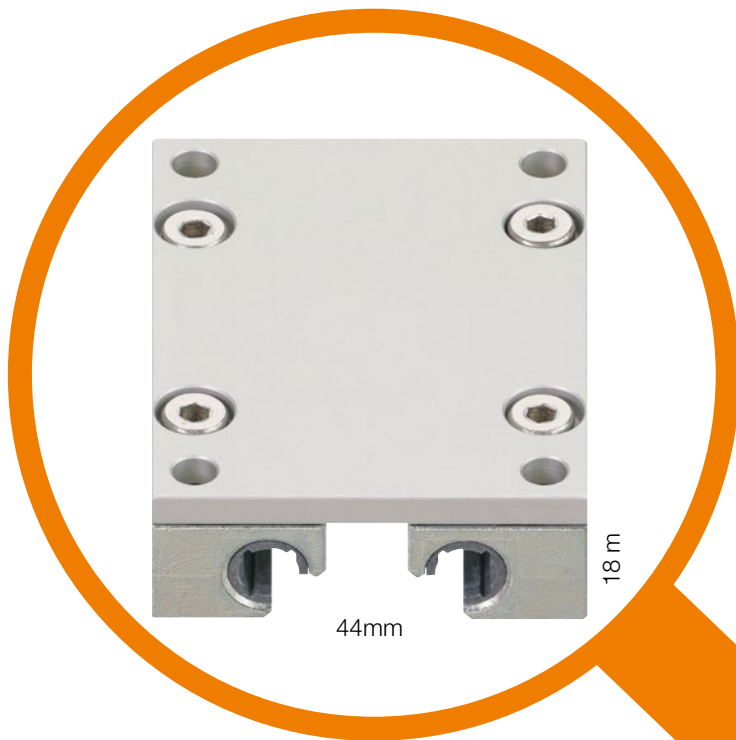
The benefits:

- Bare surfaces after soldering
- High strength of the soldered connection



drylin® W linear system

The smallest installation size



New #smallspace

Full product range

drylin® W linear system

Users have the choice between ready-to-install linear systems and variable individual components.

- ▲ Ready-to-install linear carriages in three lengths
- ▼ 20% narrower than previous installation size O6-30
- Tested: static load capacity linear system Coy 1,680N
- 100% lubrication-free due to "sliding instead of rolling"



For small installation spaces

Small and strong

The new installation size in the drylin® W linear system

The igus® linear system drylin® W is an innovative and flexible system that enables all designers and anyone who devotes themselves to private DIY projects to construct precise and reliable linear systems for a variety of applications. With its 100% lubrication-free and clean functionality, quiet and smooth sliding movements as well as its durability in adverse environments, the igus® linear system is an ideal choice for numerous industries and applications.

The heart of the drylin® W linear system consists of the dry-tech® liners made from tribologically optimised high-performance polymers from igus®. Every linear bearing, every linear carriage, every linear module with a drive offers this convenience. The igus® linear system offers many rail geometries and bearing variants. As a purely straight linear guide or as a curved guide, as a linear module in combination with drive and motor. From the drawers of the drylin® W linear system, developers can put together exactly the components to implement their ideas.

A highlight of the igus® linear system drylin® W is the new installation size 0620. It offers the greatest design freedom in the construction, even where there is a tight space. With a height of only 18mm and a width of 44mm, it is the smallest installation size in the drylin® W linear system. Users have the choice between ready-to-install linear systems with double rails with linear

carriages and individual components for variable distances and installation conditions. In addition, further product developments make it possible to adapt them individually to the application requirements. Manual clearance adjustment or spring pre-load in different classes for controlled adjustments and defined driving forces. Fixed and floating bearings for easy alignment and assembly. Hard anodised rail profiles for high-frequency movements or silver anodised for decorative visible parts. Many options for a linear guide in tight installation spaces, whether in automation technology, in laboratory diagnostics or in living room and kitchen furniture or in shop fitting.

All igus® products offer the advantages of motion plastics®, including freedom from lubricants for life, free online tools without registration (finder, configurators, CAD) and fast order processing and delivery within 24 hours for complete linear guides, for example. From prototypes to high-volume production, igus® makes everything possible to meet your requirements.

With the drylin® W linear system, ideas can be implemented and innovative products can be developed.

Be inspired by drylin® W.



Michael Homung
Product Manager drylin®

Further drylin® highlights for small installation spaces



drylin® econ
► Page 102



Stainless steel linear module
► Page 124



Selection from the drylin® W modular system, rail widths from 18 - 120mm.

New #smallspace

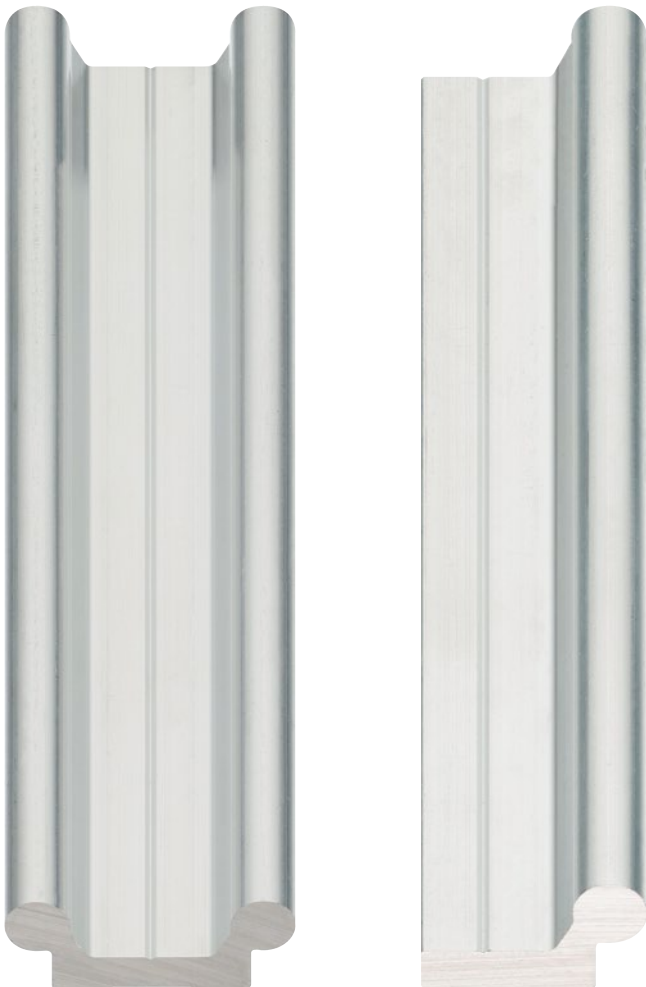


Cost-effective single bearings housings

drylin® W linear system

Cost-effective single bearing housing for horizontal and vertical installation positions. Available as a fixed and floating bearing.

- ▲ Linear housing made from zinc die-casting or aluminium
- ▼ Customisation thanks to variable individual components
- Tested in the igus® laboratory:
load 200N, acceleration 0.1m/s^2 , travel 500mm,
running performance in continuous operation:
5,000km before a bearing change
- Lubrication-free and maintenance-free operation



New #smallspace

Robust linear rails

drylin® W linear system

Double rails for quick installation without alignment. Individual rails for variable distances and installation positions.

- ▲ More robust hard-anodisation or cost-effective clear anodisation in silver (CA)
- ▼ Can be delivered with millimetre precision up to 3,000m
- High surface moments of inertia,
double rail $I_y 8,234\text{mm}^4$, $I_z 1,171\text{mm}^4$
- Best mating partner for lubrication-free
drylin® W linear plain bearings





New #smallspace

With clearance adjustment

drylin® W linear system

Linear plain bearing housing with individual clearance adjustment.

- ▲ Linear housing made from lightweight aluminium
- ▼ Easy clearance adjustment with standard 1.5mm Allen key
- Stat. load capacity (coy) 200N
- Long service life thanks to linear liners made of iglidur® J200



New #smallspace

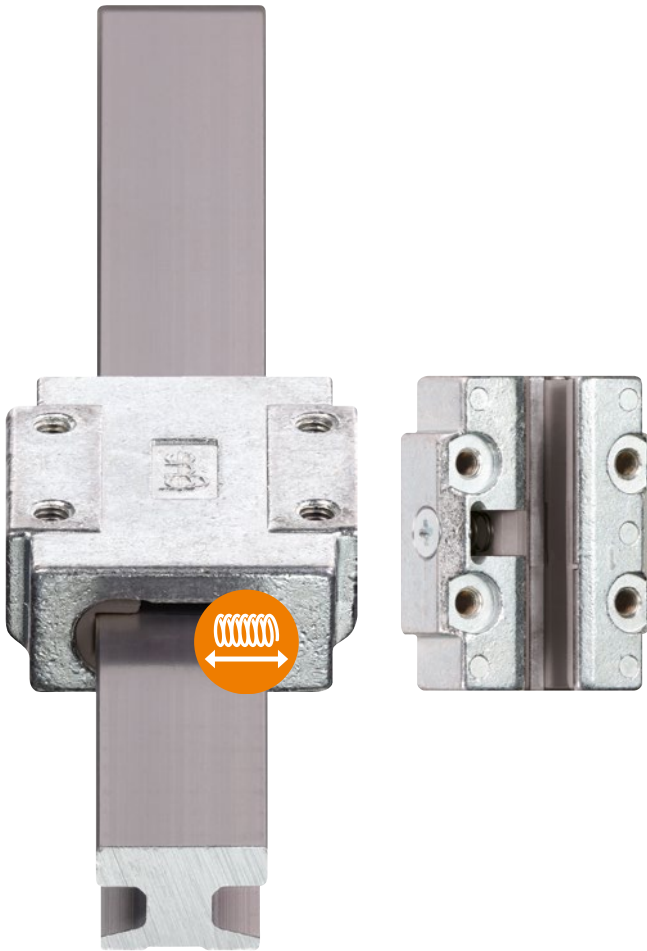
With spring pre-load

drylin® W linear system

drylin® single bearing housings with spring pre-load.

- ▲ Defined driving forces
- ▼ Choice between two pre-load classes
- Lightweight: zinc die-casting 16g, aluminium only 7g
- Precisely controlled adjustment without any stick-slip effect





New #smallspace

Best coefficient of friction with pre-load

drylin® T miniature guide

Ease of use and new freedom in design.
Now also pre-loaded.

- ▲ Linear carriage for installation size 09/12/15 with pretension
- ▼ Coefficient of friction improved by up to 40% through iglidur® E3
- Up to 30% more design freedom thanks to the 3:1 rule
- 100% maintenance-free due to self-lubrication



New #smallspace

Almost invisible

drylin® N pre-load prism slide

Extremely flat pre-load prism slide with black rails and linear carriage for precise adjustment.

- ▲ Controlled adjustment thanks to individual pretension
- ▼ Compatible with many systems: short and long carriages with plain or threaded hole
- Average driving forces and guaranteed holding forces tested in the igus® laboratory
- Compact, lightweight design with low inertia



Online purchase advice

The screenshots illustrate the online purchase advice tool's workflow. The first screen, 'Purchase advice for linear guides', allows users to define requirements and select a system type and dimensions. The second screen, 'Configuration details', shows the selected product's price (18.32 EUR) and options (20.94 EUR). The third screen, 'Select from 71 suitable products', displays a table of product variants with filters for product features and installation space.

Size	Bearing	Guide	Width	Height	Required driving force	Service lifetime (hours/minutes)	Price
17	NW-Q2-17-P	NS-Q1-17	17 mm	6 mm	3.0 N	5,578,064	20.94 EUR
17	NW-Q2-17	NS-Q1-17	17 mm	6 mm	3.0 N	5,578,064	20.94 EUR
17	NW-Q2-17-P	NS-Q1-17-AR	17 mm	6 mm	3.0 N	5,578,064	23.69 EUR
17	NW-Q2-17	NS-Q1-17-AR	17 mm	6 mm	3.0 N	5,578,064	23.69 EUR
27	NW-S1-27-60-P	NS-Q1-27	27 mm	9.5 mm	3.0 N	9,127,136	29.06 EUR
27	NW-S1-27-60-P	NS-Q1-27	27 mm	9.5 mm	3.0 N	9,127,136	29.06 EUR

New

Advise, calculate, buy

drylin® linear guide expert

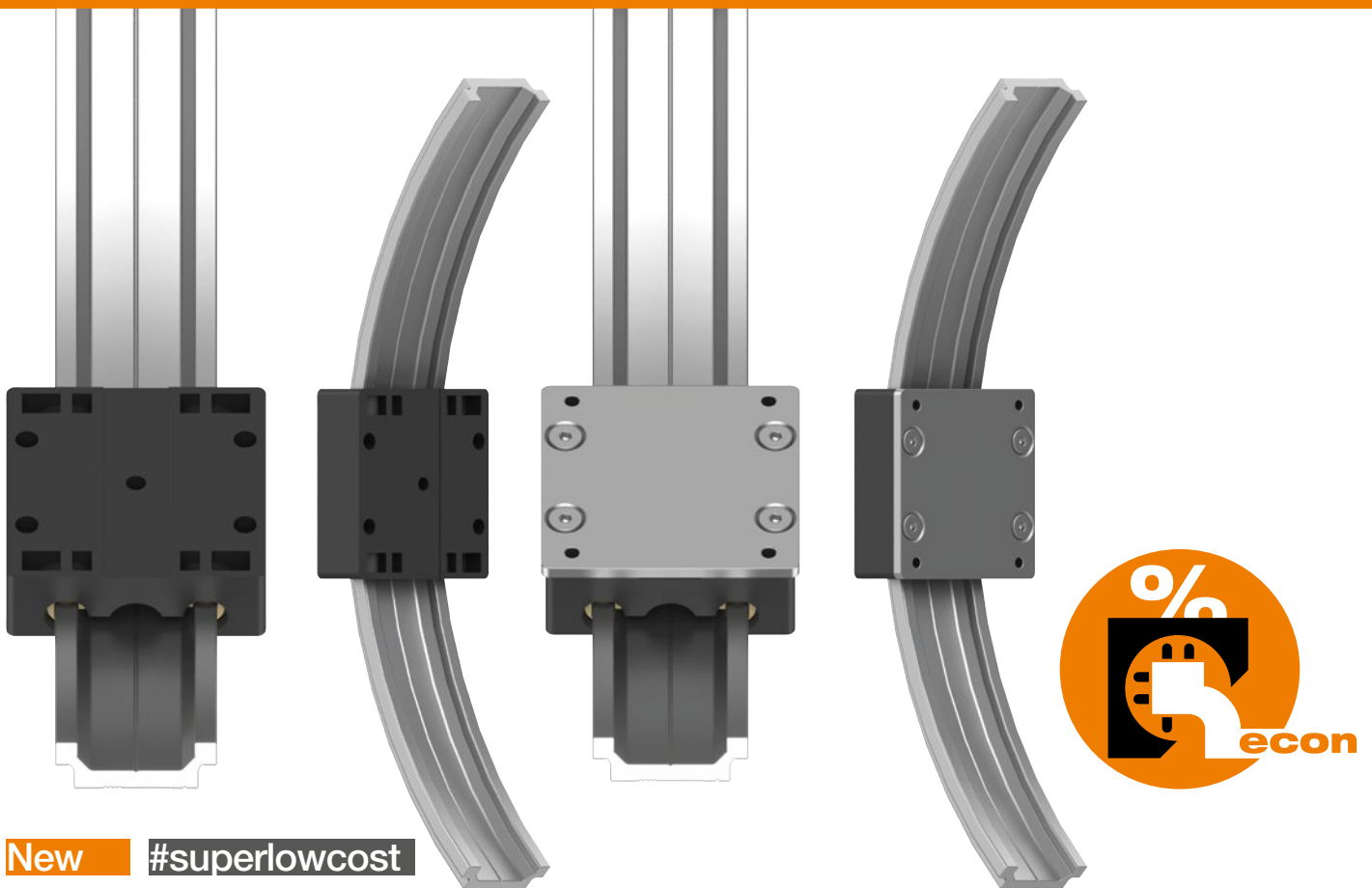
Find the right solution for your application: select installation position; enter application parameters; select and order system.

- ▲ Direct statement about suitability and expected service life
- ▼ Individual sorting option by cost
- All technical data are based on real test runs in the igus® laboratory
- Product selection in the online tool is 100% lubrication-free, 100% maintenance-free: igus.eu/dlx



drylin® econ

Cost-effective starter series



New #superlowcost

Left and right, up and down

drylin® econ

The econ polymer carriage for curved rail in installation size 0630 for adjustments in quarter, half and full circles as well as for convex and concave curved guides.

- ▲ Extremely lightweight components
- ▼ Fast assembly on standard curved rails
- 100% lubrication-free and maintenance-free thanks to igus® high-performance polymers
- No external lubrication



The most cost-effective solution that works is the best

Innovative and with a fast ROI ... drylin® econ carriage for curved rail

The most cost-effective solution that works is the best. This description briefly and concisely characterises the drylin® econ series. A ready-to-install entry-level series for simple positioning and adjustment tasks. Highly efficient in operation, cost-effective for a quick return on investment.

The central components of the econ series are black (WWP) linear carriages made from igus® high-performance polymers and silver anodised (CA) linear rails.

All econ linear plain bearings and linear carriages are 100% lubrication and maintenance-free and are manufactured cost-effectively using the igus® injection moulding process. In contrast to mechanical milling, time and costs can be saved, especially in high-volume production. Due to the reduction in the number of components, storage is cost-effective and installation

is very simple. In addition, drylin® econ linear guides impress with their lightweight feature. The use of plastic and aluminium makes them suitable for all lightweight constructions.

The new drylin® econ polymer carriage for curved rail in installation size 0630 is an absolute eye-catcher. The carriage can be used on all curved drylin® W rail profiles thanks to the self-adjusting polymer spherical balls in the bearing points. Whether quarter circle, semicircle or full circle. Whether curved concavely or convexly, with standard radii or custom-made. Thanks to the integrated pretension, the movement is easy, quiet and rattle-free. Thanks to the curved drylin® WSB double rails and matching drylin® econ carriage for curved rail, innovative applications can be implemented quickly and easily. Whether for vending machines, in system catering, stage technology, in shop fittings or in the interior of driver's cabs. Always

lubrication-free in operation and with an energy-efficient dead weight, many adjustment tasks can be carried out ergonomically and safely.

drylin® econ. For all applications. Whether drylin® W linear guide, curve guide, positional system, linear module with dryspin® lead screw technology or fast toothed belt axes. Innovative injection moulding technology from igus® combined with smart functions. Efficient manufacturing processes. More cost-effective than building your own.

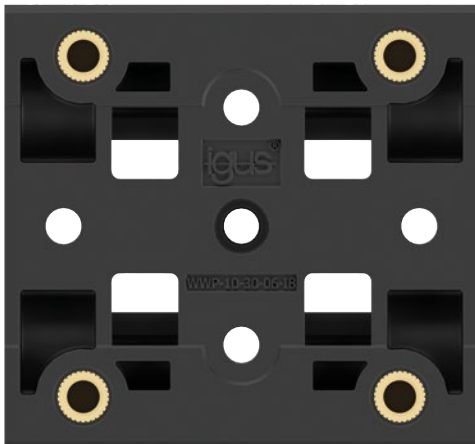
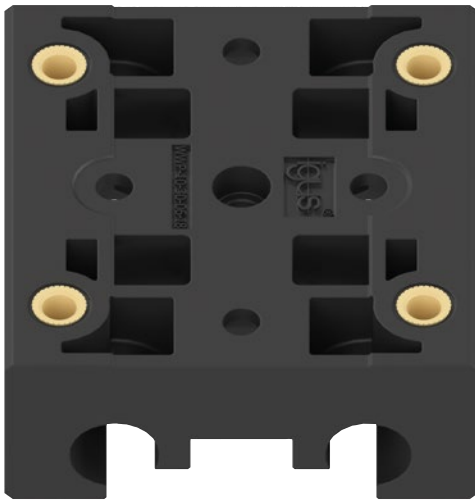


Matt Mowry
Product Manager drylin®
igus® USA

Further highlights

drylin® econ product range





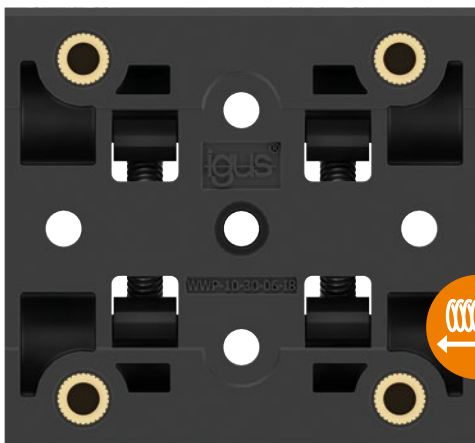
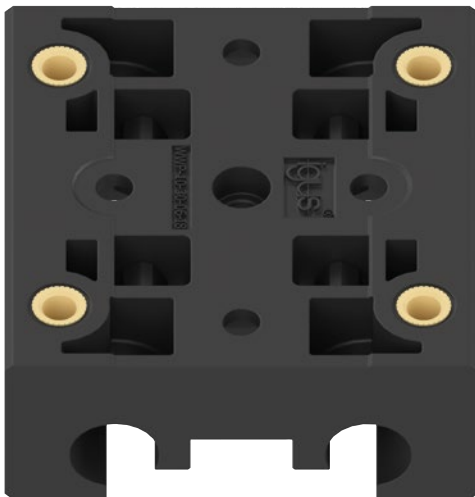
New #superlowcost

Light and cost-effective

drylin® econ polymer linear carriage

The first solid-plastic carriage for the compact installation size 1030 of the drylin® W linear system. Extremely simple installation thanks to the monoblock shape.

- ▲ Quickly mountable linear carriage due to monoblock design
- ▼ Cost-effective injection moulding
- 80% weight saving compared to aluminium linear carriage (WW-10-30: 0.24kg; WWP: 0.043kg)
- 100% lubrication-free due to iglidur® JB



New #superlowcost

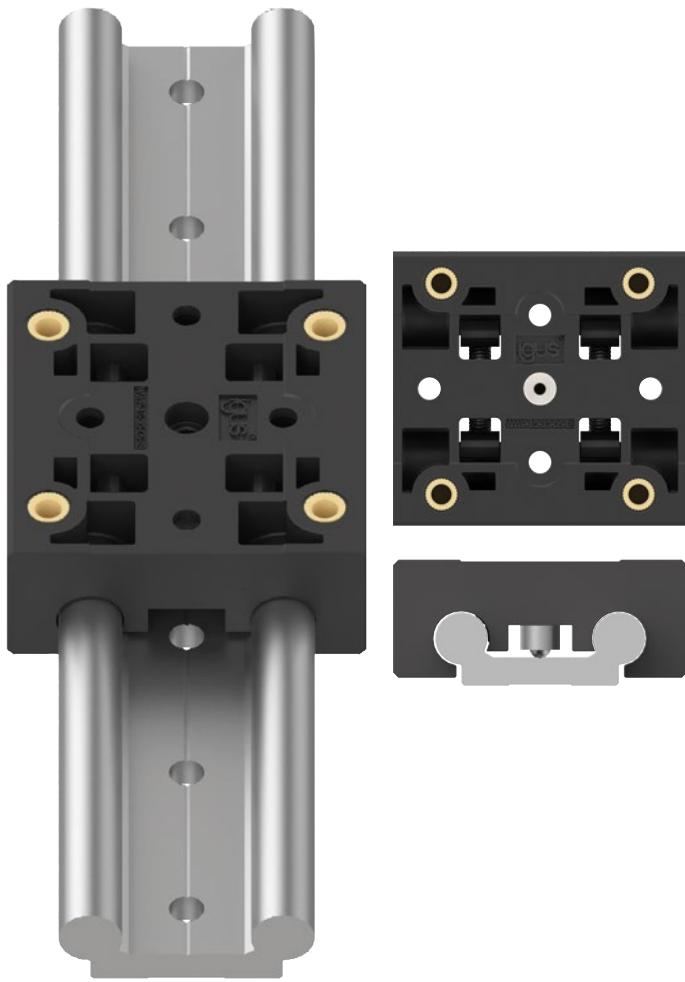
With spring pre-load

drylin® econ polymer linear carriage with pretension

The WWP-10-30 polymer carriage can be configured with integrated pre-tensioning elements for applications that require absolutely no rattling or a defined displacement force.

- ▲ Defined driving forces
- ▼ 100% maintenance-free operation due to self-lubrication
- 80% weight saving compared to aluminium linear carriages (WW-10-30: 0.24kg; WWP: 0.043kg)
- Noise-reduced sliding due to the absence of balls





New #superlowcost

Easily hold the position

drylin® econ polymer positioning carriage with locking ball

As a third variant, the econ polymer carriage WWP-10-30 is available with an integrated locking ball. In this way, certain stopping points on the rail can be approached.

- ▲ Controlled holding points on drylin® W double rail WS-10-30
- ▼ Standard linear carriage WWP-10-30 optionally expandable with locking ball and pretension
- 40% weight saving compared to aluminium compact carriages (WWP-10-30: 0.24kg; WWC-06-30: 0.07kg)
- 100% lubrication-free due to iglidur® JB



New #recycling

CO₂ reduced econ liner

drylin® R liners

drylin® R liners made from iglidur® J4 with a high proportion of regranulate (min. 97%) and a CO₂ footprint reduced by over 60%.

- ▲ For drylin® R round shafts with a diameter of 12 - 40mm and drylin® W linear guides with a diameter of 10 - 25mm
- ▼ Savings potential min. 25% compared to liners made from iglidur® J
- Tested in the igus® laboratory: wear rate iglidur® J4: 0.24µm/km (p = 0.3MPa), average coefficient of friction on hard-anodised aluminium shaft AWMP: 0.28µ
- 100% lubrication-free



drylin® R on wooden shafts

Wear resistance on wood



Study

Sustainable thinking ahead

drylin® R on wooden shafts

We have carried out various tests on the coefficient of friction and the wear rate of our materials. Plain bearings and liners made from the materials iglidur® J and J4 were tested on various wooden shafts and compared with metal shafts.

- ▲ Metal-free linear guide
- ▼ Extremely lightweight components
- Friction test of iglidur® J4 liner on round shafts made of different woods, Ø 20mm, load 200N, 0.1m/s, determined friction values 0.2 - 0.25μ
- Round shafts made from renewable raw materials



How do igus® materials behave on wooden shafts?

drylin® product developer Lars Fenger in an interview

What was the decisive point for the study "drylin® R on wooden shafts"?

Due to the lower surface pressure of our drylin® linear plain bearings, they are generally also suitable for use on round shafts with softer surfaces. Quite the opposite of ball bearings, which require a hardened surface. Aluminium shafts and tubes are already in the delivery portfolio, as well as extremely lightweight carbon shafts. And with our study we are collecting results with wood, a renewable raw material.



Which tests were carried out?

In order to make an initial selection from the variety of wood, flexural strength tests were carried out in the igus® laboratory. And with the appropriate types of wood, friction coefficient and wear results were determined.

What were the results?

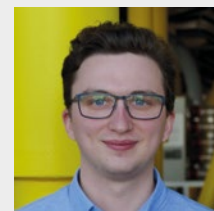
In short ... wood and drylin® linear technology works. And works even better. The results have shown that the coefficients of friction determined differ only slightly from the results on steel or aluminium. And the wear results for bearings and shafts are also very promising. Especially in combination with our new drylin® R econ linear plain bearing J4, some types of wood, e. g. dampened beechwood, offer a good mating partner with good results.

What is particularly important?

The tests were carried out in a dry laboratory environment; dirt and moisture can decisively change the measurement results in contrast to, e. g. stainless steel. We are constantly expanding our test series for different woods, and local availability also plays a central role here. At the trade show we want to gather initial customer experiences on the subject and support customer projects with drylin® and wood. The first customer applications with plain bearings on wooden shafts already exist. Here is a participant in the manus® awards 2023, the height-adjustable Dexter desk from the company Furnature (see info box).



We at igus® also share the values of the company Furnature. Therefore, in addition to the coefficient of friction, the study also examines CO₂ reduction and the suitability of our recycling material iglidur® J4, which is used in the test in linear plain bearings.



Lars Fenger

Product Development drylin®



Height-adjustable desk Dexter

"Dexter is a manually height-adjustable and tiltable wooden desk. With the purely mechanical adjustment mechanism, it is very important to achieve very low coefficients of friction, otherwise it is no longer pleasant to use. In addition, the most sustainable bearing solution was sought, including in particular CO₂ emissions, durability, recyclability or a small amount of material. In addition, the bearing should be user-friendly, i.e.: maintenance-free, replaceable if necessary and easy to dispose of or recycle."

Paul Wulff, Furnature

drylin® NT telescopic rails Heavy Duty

Strong and durable



New #heavyduty

Pull out loads up to 12kg

drylin® NT telescopic rails Heavy Duty

The robust aluminium rail accepts loads of up to 12kg, with a durable coating of iglidur® IC-05 for a lubrication-free extension.

- ▲ Telescopic extension up to 1,000mm in the application area up to max. +80°C
- ▼ Telescopic rail can be ordered with infinite adjustment from 140 - 1,000mm
- Choice of coating with iglidur® IC-05 after tests:
linear short stroke, lasts up to 4 times longer than iglidur® IC-01
- Slide silently instead of generating rolling noises from balls



Double the load, longer extension

Pre-loaded and quiet, the new telescopic rail NT-35-P-HD with pretension and smooth operation

Wherever objects are pulled out of an installation space, telescopic rails are installed. They consist of several rails that move and pull apart from each other, whether in vending machines, laser marking systems or in interiors, e. g. for headrests or table extensions.

So that users can rely on a lightweight and lubrication-free solution, even for higher payloads, igus® has now expanded its drylin® NT telescopic rail series. The new drylin® NT-35-P-HD telescopic rails from igus® set new standards in terms of load capacity and extension length of rails of this type. The robust combination of coated aluminium rails is able to take loads twice as high as the NT-35 model of the same dimensions.

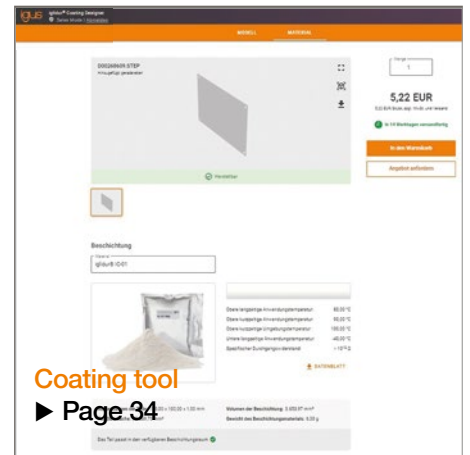
But that's not all: the maximum extension length has been increased by 42% to 1,000mm. The telescopic rail NT-35-P-HD offers even more flexibility and application potentials thanks to higher loads, stability and extension lengths. The internal centre rail made of aluminium is coated with iglidur® IC-05. Ideal for metallic surfaces, the IC-05 offers excellent coefficients of friction and wear, which enable rails to be extended without additional lubrication

at operating temperatures of up to 80°C. The coating ensures a long service life and is extremely durable. The telescopic rail is therefore particularly suitable for applications in harsh environments or those that require high resilience.

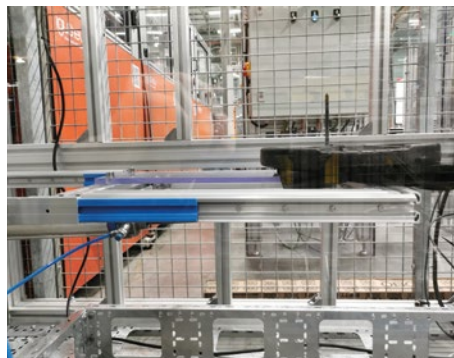
The NT-35-P-HD telescopic rail is easy to install and, thanks to its construction, offers high stability and rigidity. It can be ordered in the desired extension length and adapts to any application environment. Both the NT-35-P-HD with an aluminium centre rail and the NT-35-P with a light plastic rail continue to benefit from new pre-load elements. These give the rails a full, high-quality operation.

Due to the use of maintenance-free plastic sliding elements or coating instead of metallic balls, it operates quietly both indoors and outdoors.

Dirt, dust, water or even vibrations cannot harm the rail. This makes them the ideal choice for many applications in automation, the mechanical engineering industry and also as compact pull-outs in campervans for safe and accessible storage of kitchen blocks, provisions and beds.



In order to make optimal use of the limited space and storage space in the vehicles, the pull-outs can be configured in any extension length. The NT-35-P-HD as well as the NT-35-P aluminium rails are available both silver anodised and in unobtrusive black.



Lee Wilkins
Product Manager drylin®
igus® UK

Inner rail surface: tribologically optimised coating powder iglidur® coating IC-05.

drylin® NT telescopic rail

With spring pre-load



New

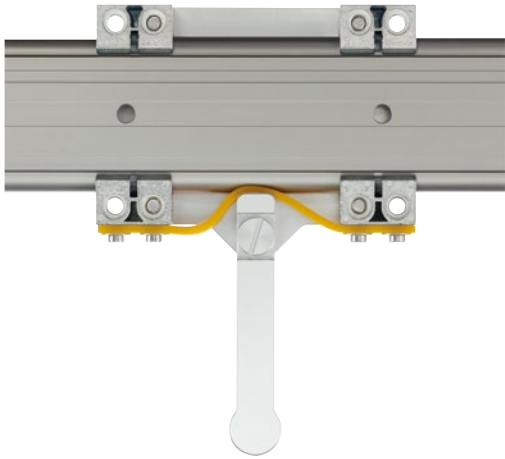
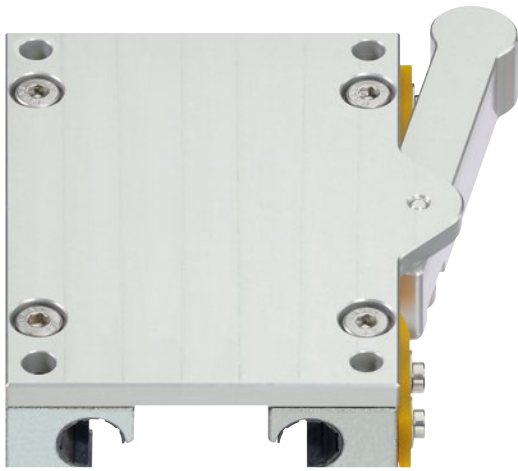
Pre-loaded and quiet

drylin® NT telescopic rail

The new generation of telescopic rails NT-35-P with pretension and smooth operation.

- ▲ Consistent telescopic rail due to spring pretensioning mechanism
- ▼ Extensions lengths accurate to the millimetre up to 600mm
- Load capacity of a drawer with two vertically installed systems, 450mm extension, load capacity 50N
- No external lubrication





Strong clamping

Robust drylin® WW-HKX clamping

The position of the linear slide can be secured with a lever. An elastomer strip holds the carriage in place.

- ▲ Pre-assembled linear carriage with integrated hand lever
- ▼ Linear carriages delivered ready-to-install
- Clamping as single-stage brake on rail profile WS-16-60/WS-20-80, vertical installation position, load 60N, clamping period 14 days. Result: no loss of position
- All metallic parts completely reusable



Clip, adjust, lock

Clip-type linear carriages with clamping

This clip-type linear carriage combines the practical mechanism of installing the carriage in place or removing it using a clamping function.

- ▲ Clamping of the linear carriage as protection against vibration and unintentional adjustment
- ▼ Safe external storage of valuable equipment
- This product was developed from customer requests. Do you have suggestions and ideas for this product? Feel free to contact us.
- All components are recyclable



New

Edge protection

drylin® WSZ rail end caps

Secures the carriage and elegant covering of the rail edges thanks to end caps for WSR-10-120 drylin® W rail.

- ▲ Stylish rail end protection
- ▼ Quick assembly without tools
- Rounded edge protection geometry for securing the carriage
- Can be disassembled and reused



New

Adjust loads easier

Tandem roller bearings with ball bearings

The tandem design with two pivoting bearing rollers offers twice as much load capacity as bearings with single rollers.

- ▲ Uniform load distribution thanks to the guide roller system with pivoting bearings
- ▼ Fast assembly with a single tandem bearing instead of two single bearings
- Double the load capacity of 01-series WJRM roller bearings with single roller
- 100% lubrication-free operation



More drylin® linear products

Change quickly



Dry operation, maintenance-free. drylin® linear guides

igus motion plastics® for longer life igus

dryspin® lead screw technology
instead of ball-roller thread

drylin® R round shaft guide
instead of ball bushing

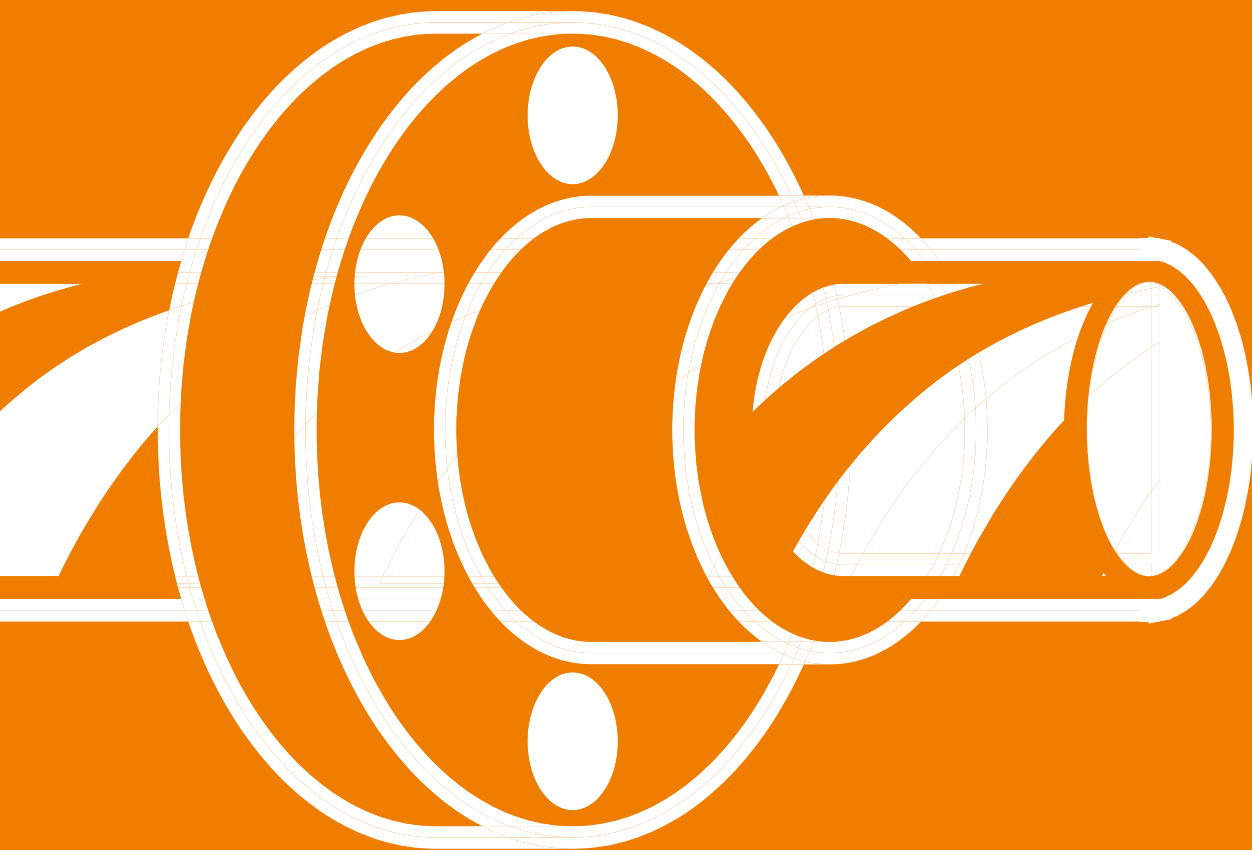
drylin® T14/04 mini
instead of recirculating ball systems

igus.eu/dryway-samplebox



dry-tech® | Lubrication-free made easy ...

dryspin® **lead screw** **technology**



igus.eu/news-dryspin

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lead screw systems
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motion plastics® for quick replacement

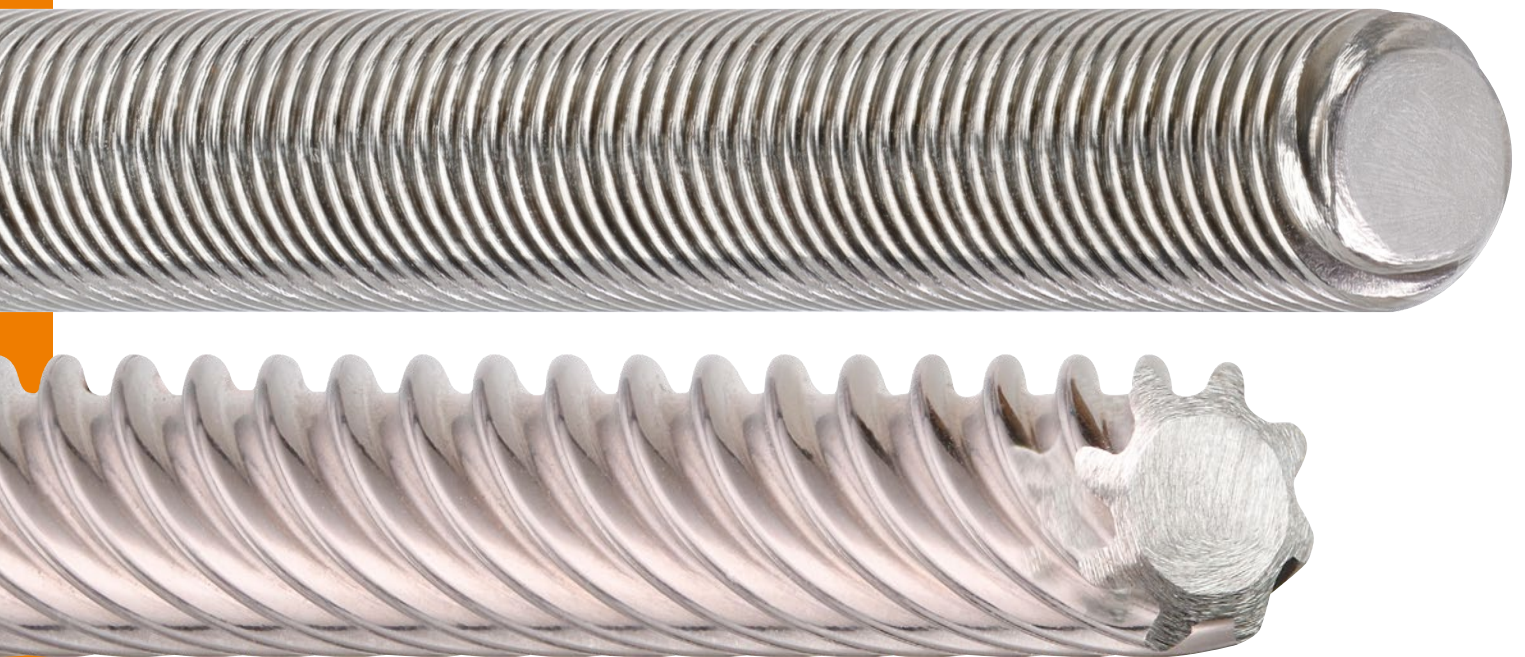
Digital

- 114** dryspin® lead screw configurator
Online tool for lead screw machining without previous CAD knowledge, including 2D dimension drawing and live price: igus.eu/dsk



New dryspin® lead screw dimensions

Smooth, quiet, long service life



New #exchange

Save costs with lead screw systems

New dryspin® dimensions: extension of the sliding and high helix thread product range

All dryspin® leads screws can be custom machined. Please configure this online or send us your drawing. We can then provide a quotation quickly.

- ▲ 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-test-reports
- 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



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 patented in 2014 by the dryspin® lead screw technology 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 flanks of the dryspin® thread geometry

The rounded tooth flanks and tighter manufacturing tolerances of the dryspin® thread geometry reduce the possible noise-causing contact surface between the lead screw nut and the lead screw. 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.

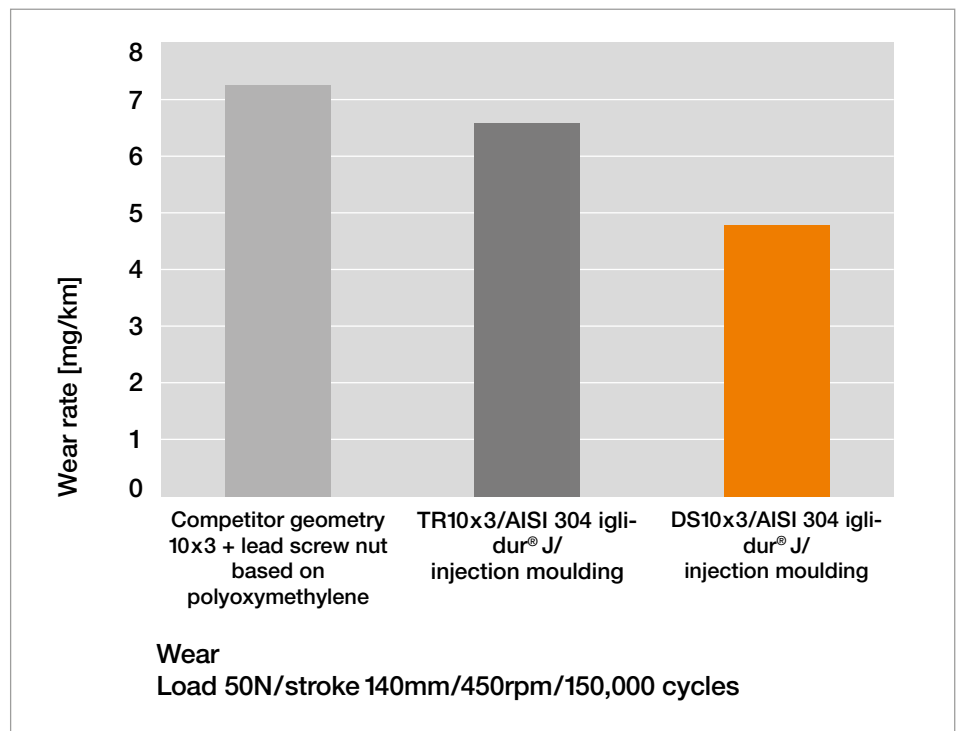
Up to 30% longer service life thanks to asymmetry

Due to the larger distances between the individual dryspin® thread turns, the thread perfectly matches the specifications of the lubrication-free igus® high performance polymers. The proportion of the tribologically optimised polymer in the thread turns can be enhanced by a factor of 1.3. More wear-resistant material and higher levels of efficiency are crucial for a service life that is up to 5 times longer compared to standard thread geometries.

igus.eu/dryspin-test-reports



Thorben Hendricks
Head of Business Unit dryspin®





New #exchange

Lead screw nuts made from bar stock

New pitches DS8x2, DS10x2 LH and DS20x50 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
- 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



New #exchange

Injection-moulded lead screw nuts with machined thread

New pitches DS8x2, DS10x2 LH and DS20x50 LH (machined thread)

The new dryspin® injection-moulding 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
- 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



dryspin® plastic lead screw support blocks

Lightweight and lubrication-free



Study #superlowcost

New lead screw support block design in 4 sizes

Easy assembly and 1:1 connection dimensions as metallic lead screw support blocks.

This study combines reinforced plastic blocks with a metallic clamping ring and iglidur® plain bearings for the fixed-bearing version and only the plastic blocks with an iglidur® special slider for the floating-bearing version. The design allows each thread to be mounted in installation sizes Ø6-12mm.

- ▲ Weighs up to 80% less than commercially available metallic lead screw support blocks with the same connection dimensions
- ▼ Costs up to 60% less than commercially available metallic lead screw support blocks with the same dimensions
- This study was developed in response to customer requests according to our motto: cost-effective, lightweight, and lubrication-free
- Lubrication-free operation and ideal for lightweight construction



Pre-load lead screw nut with dryspin® thread

Minimum axial clearance



Request sample online



New #smallspace

Maximum positioning accuracy

Pre-load lead screw nut with dryspin® thread

The new pre-load lead screw nut convinces with minimal axial clearance and highest positioning accuracy. It is the cost-effective alternative to the zero backlash lead screw nuts and perfectly suited for small pitches. This is the proven preload principle from SHT-PL.

- ▲ Consistent minimum axial clearance for high positioning accuracy
- ▼ More cost-effective compared to zero-backlash lead screw nut due to fewer components and injection-moulding manufacturing process
- Less axial clearance due to lead screw nut spring pre-load
- No grease or oil in the lead screw drive



What should you do in the event of unwanted axial clearance?

Axial clearance - what exactly is that? How is it defined and what needs to be considered?

The question of clearance is often asked in the case of plastic lead screw nuts. This describes the lost motion, i.e. the "dead travel" on the lead screw, or in other words the gap between the thread flanks of the lead screw and the lead screw nut. The term clearance is often used in general. In this context, the correct technical term is axial clearance. It outlines the movement of the lead screw nut in the axial direction without movement of the lead screw.

Lead screw drives require a minimum clearance to maintain their function. If the axial clearance is too small, the torque required to move the lead screw nut will also increase.

What I need to consider:

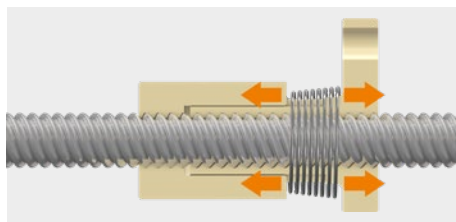
In addition to the axial clearance caused by the manufacturing tolerances, the application-specific influences must also be taken into account. In addition to thermal and hygroscopic environmental influences, the minimum clearance to be considered in the application must also take into account the friction heat generated by the application. This plays a decisive role in connection with the expansion behaviour of the polymer material used. As the axial clearance in the system can change with temperature fluctuations.

How can I reduce the axial clearance?

An effective measure for reducing unwanted clearance, in addition to the correct material choice, is a pretensioning mechanism. For our dryspin® high helix threads and trapezoidal threads there are four versions with preload: Zero-Backlash, Preload, Low-Clearance and AB lead screw nut.

The working principle of the pre-load lead screw nut

PL lead screw nuts reduce the axial clearance in a lead screw drive by preloading two lead screw nut parts with a compression spring. The spring pushes the two halves of the lead screw nuts apart axially in the direction of the spindle flanks. As long as the axial load in the lead screw drive is lower than the spring pretension, the entire lead screw drive has a minimised backlash. This also permanently reduces clearance caused by wear.



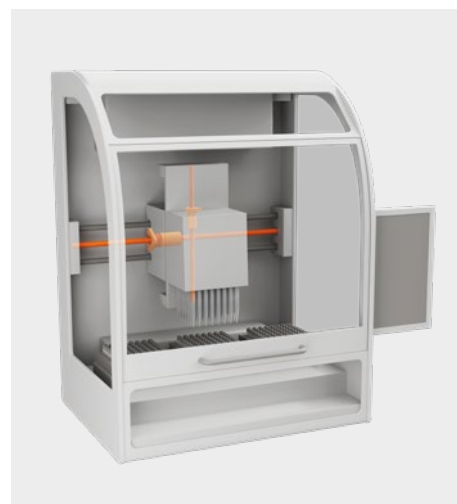
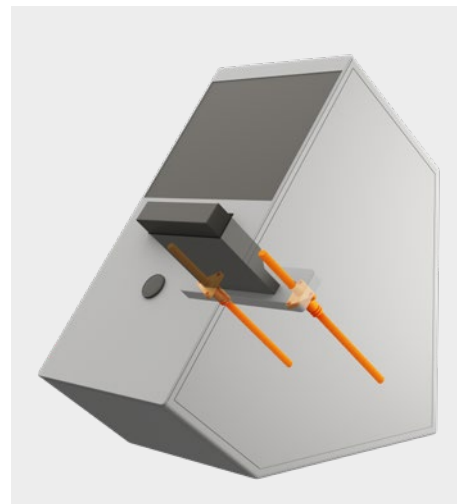
Possible applications in medical technology

Lubrication-free operation and high precision are very important, especially in medical technology. Due to the low-clearance and cost-effective function of the PL lead screw nut, numerous advantages can be achieved for both horizontal and vertical movements:

- Clean operation due to lubrication-free and maintenance-free properties
- Minimum axial backlash without readjustment
- Precise positioning and infeed movements
- Smoother operation and fewer vibrations thanks to the combination of the dryspin® thread profile and the pretension of the lead screw nut

The price and technology advantages can be combined optimally in both pipette head adjustments and sample collection. For applications with high

loads, high temperatures or in heavily polluted environments, a standard lead screw nut should always be used. The reason for this is that all four principles are cancelled out by high loads. For this reason, the maximum static axial loads are specified separately for each lead screw nut model.



For our lead screws there are four versions with pretension:

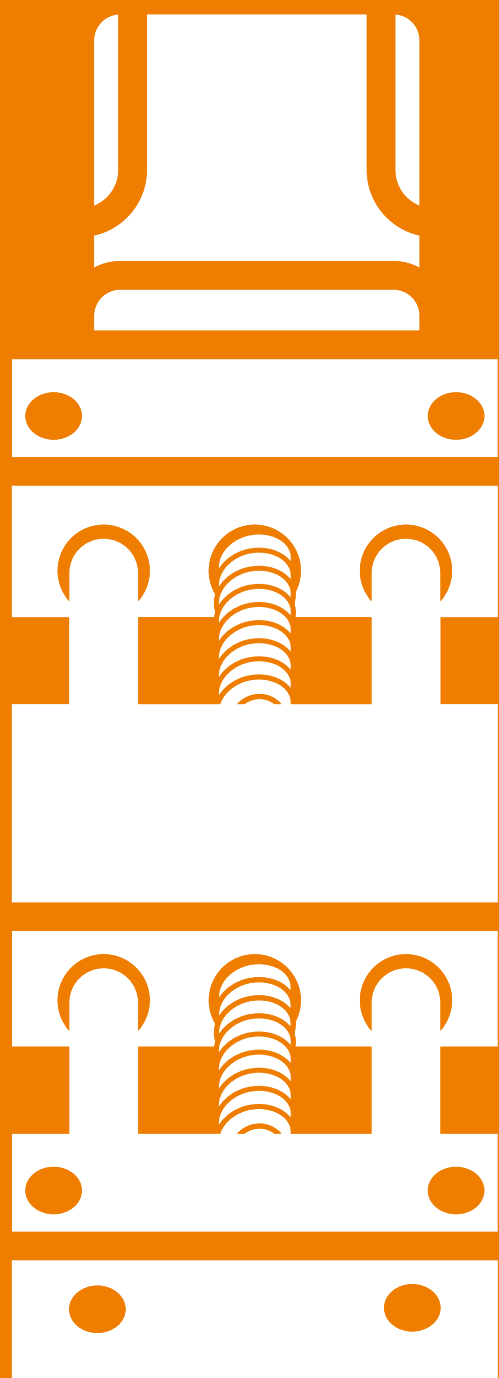
Zero-Backlash, Low-Clearance, Pre-Load and AB lead screw nut. Here you will find all the advantages and assembly instructions for our clearance-reduced lead screw nuts.

[igus.eu/low-clearance-lead-screw-nuts](https://www.igus.eu/low-clearance-lead-screw-nuts)

dry-tech® | Lubrication-free made easy ...

drylin®

drive technology



igus.eu/news-drylin-drive

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drylin® drive technology configurator
igus.eu/ddx



Tech up



Cost down



Proof



Sustainability

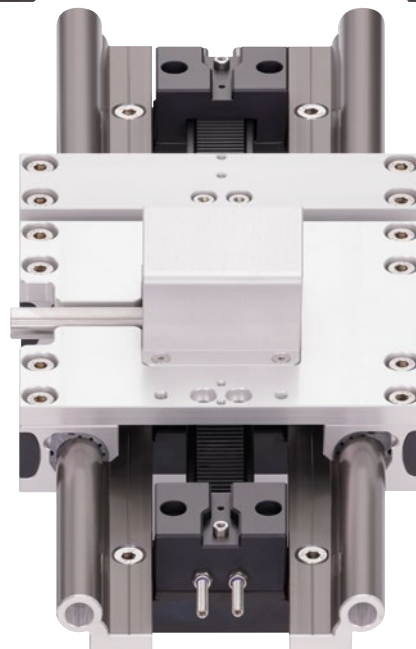
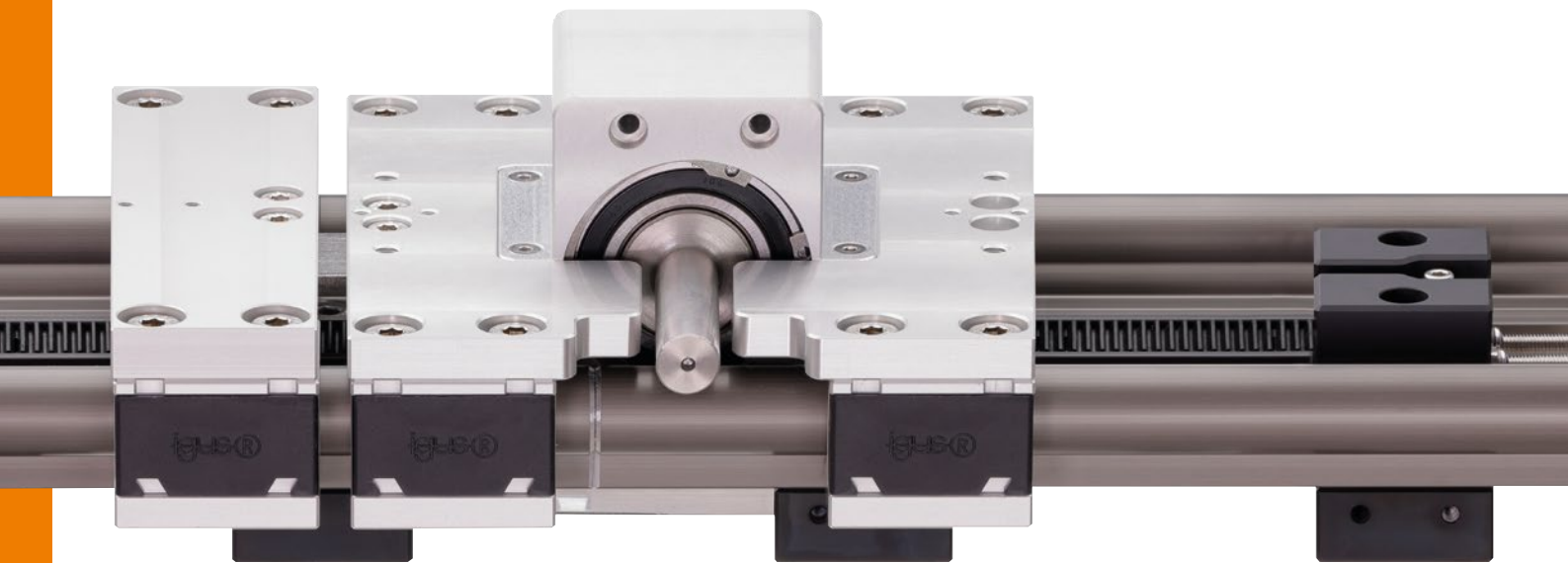


Digital

121

drylin® EGW - Endless Gear linear module

Modular and easy to install



An almost endlessly expandable drive

drylin® EGW - Endless Gear linear module

On a rail profile, several carriages can be controlled in parallel but independently of each other. Travels can also be easily extended at a later date.

- ▲ Rack and pinion elements modularly (endlessly) expandable
- ▼ Linear carriage with exchange bearing for changing directly on the rail
- Load 200N, speed 1m/s, room temperature, total stroke length 9,000mm/cycle, tested for 600,000 cycles
- 100% lubrication-free through the use of igus® high-performance polymers in all bearing points



For long travels

Modular linear module EGW

Construction kit system for long travel lengths (thanks to rack and pinion technology)

Linear axes with toothed belt drives are used for many handling and positioning tasks. The problem is that from a length of more than 10 meters, the toothed belts start to sag. The elongation of the belt makes driving more difficult. That is why igus® developed drylin® EGW with a rack and pinion drive. Unlike toothed belt drives, with this system several carriages can move on one rail in different directions at different speeds.

Thanks to a modular principle, several rails can be easily assembled and extended to any length easily. Their length (only two metres) significantly simplifies the handling and transport.

The basis is the drylin® W guide rail WS-20, a guide rail made of hard-anodised aluminium with a round profile, on which the carriages slide. In the middle between the two, there's a profile to receive the rack modules. The second component is the carriage drive with electric motor driving the gear that engages in the gear rack. The third component is a towing carriage, on which a camera or handling units like sensors can be mounted. From linear guide and carriages to cables and energy chains, igus® delivers everything from one source – if required, we will deliver your kit ready to install, including motor and control system.

Testing or monitoring tasks can be carried out with repeatability using the modular linear guide, even over very long travels - whether to inspect train roofs or workpieces in the automobile production. Thanks to corrosion-resistant components, drylin® EGW is also suitable for outdoor use. In addition, it convinces with a significantly lower-vibration and quieter operation compared to conventional recirculating ball systems. Due to the high-performance plastics used at the bearing points, the linear guide is also lighter, so that less drive

energy is required. At the same time, the solid lubricants integrated into the plastic enable low-friction dry operation. The maintenance effort is correspondingly low.

Tests in the in-house laboratory at igus® prove how durable drylin® EGW is. Should the linear guide eventually reach its wear limit, users can replace the liners directly on the rail in just a few minutes and without dismantling the bearing housings.

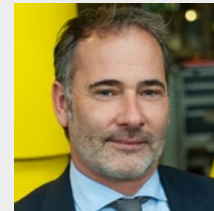
Download installation instructions
igus.eu/EGW-assembly



Linear module EGW-20 with rack and pinion drive

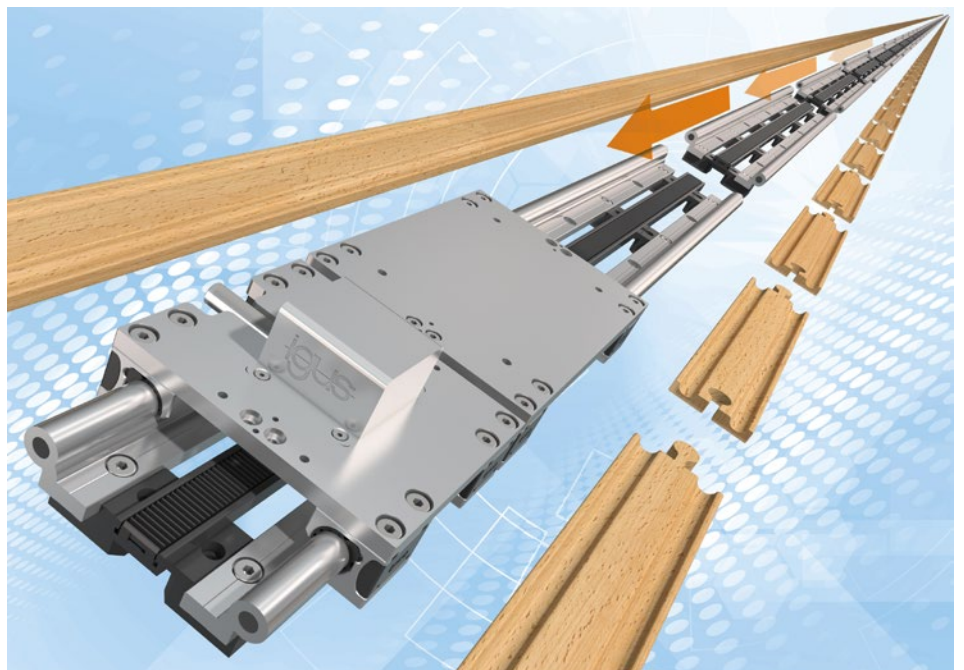
drylin® W with drylin® E stepper motor NEMA34 with encoder, modular design consisting of five rail segments.

Stroke length: 8,000mm,
load: centric 200N,
speed: 1m/s,
test cycles: 600,000



Stefan Niermann

Head of Business Unit drylin®



Stainless steel linear module

Slim and fast



New #food

Ready-to-install toothed belt axis

Stainless steel linear module

Addition of the ZLW stainless-steel linear module with a compact width of 50mm to the drylin® modular system. 24/7 operation thanks to modular housing for quick bearing replacement without dismantling.

- ▲ Extremely durable thanks to stainless steel components
- ▼ Ready-to-install system with a maximum stroke length of 2,000mm
- Tested in the igus® laboratory: drylin® W linear system Ø10mm, carriage length 100mm, iglidur® E7 liners, load 30N, service life 4,000km in continuous operation until bearing replacement
- Completely lubrication-free operation



Ready-to-install linear modules

Corrosion-resistant toothed belt axis drylin® ZLW-1050-ES

Drive units with toothed belts for positioning tasks, for long travel lengths in combination with high dynamics. It is precisely this application area that characterises drylin® ZLW toothed belt axes. Whether in small or large sizes, igus® supplies all ZLW series in the required stroke length cut to the millimetre, completely ready for installation. In addition, all drylin® ZLW systems can be configured with suitable electric motors and motor control systems.

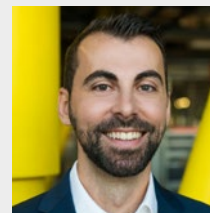
The new ZLW toothed belt axis ZLW-1050-ES made of stainless steel expands the product range of igus® toothed belt axes. It is characterised by its slim design and corrosion resistance. With a centre distance of 50mm, it is extremely compact and is ideal for use in small spaces, as a single axis or in parallel constructions as well as gantry structures. Thanks to the use of stainless steel, the ZLW toothed belt axis is extremely corrosion-resistant, robust and suitable for long, maintenance-free operation.

The linear slides of the ZLW toothed belt axis are equipped with drylin® liners made of iglidur® E7, ensuring a high running performance, maintenance-free. The liners are self-lubricating and therefore particularly easy to clean. A neoprene toothed belt with glass fibre

reinforcement and RPP-3M tooth profile serves as the toothed belt. The belt tension can be easily adjusted on the carriage. The interaction of stainless steel and drylin® liners makes the ZLW toothed belt axis made of stainless steel a clean, hygienic and reliable solution for applications that require both corrosion resistance and compactness.

The open modular design of the ZLW-1050-ES is also an ideal solution for applications in areas such as the food and beverage industry, medical technology or in environments with specific hygiene requirements. On request, the bearing points can be equipped with FDA-/EU-compliant liners. For high-frequency applications such as 24/7 use, suitable linear plain bearings are available within seconds for quick bearing replacement. It is easy to exchange the liners without dismantling the system.

All drylin® ZLW toothed belt axes can be configured and ordered online. Delivery from one source.



Aurélien Erson
Product Manager drylin®
igus® France

FDA- and EU10/2011-compliant

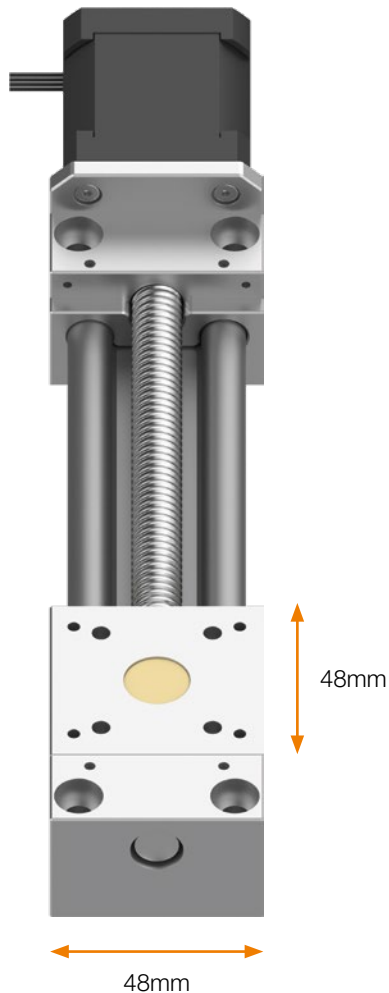
Liners made from iglidur® A160



Longest service life with stainless steel

Liners made from iglidur® AE7





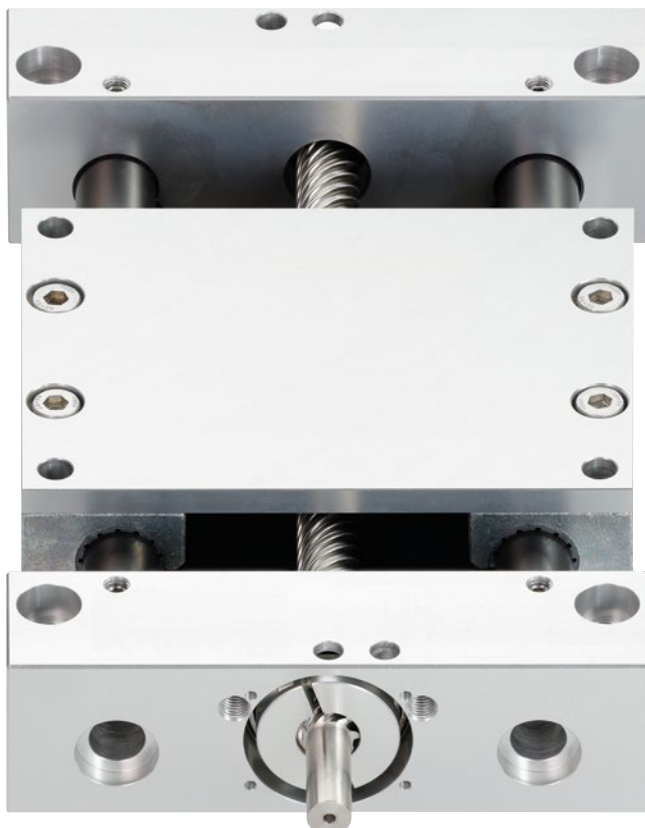
New #smallspace

Small and strong with spindle motor

Compact linear module

Ready-to-install linear module drylin® SLWC with drylin® E lead screw motors available. Save up to 35% installation space.

- ▲ For dryspin® pitch with \varnothing 10mm
- ▼ Ready-to-install system lead screw support in the motor
- Tested in the igus® laboratory: dryspin® thread Ds10x25, stroke length 300mm, dynamic axial force 300N, speed 24rpm, duty cycle 50%. Result: service life of 204,260 double strokes
- 100% lubrication-free and maintenance-free



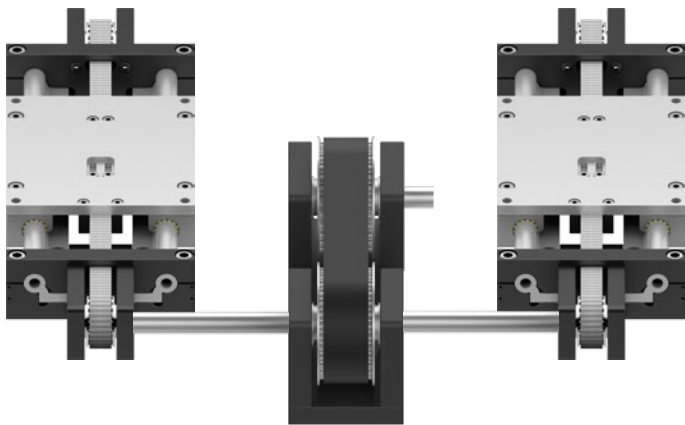
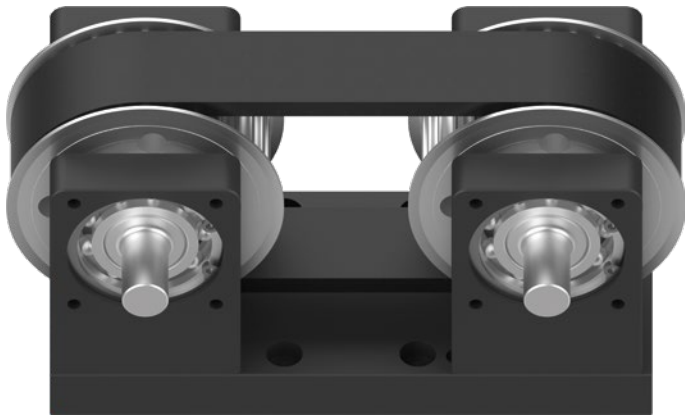
More dynamic than ever

Linear module with dryspin® lead screw technology

The SLW linear module (installation size 25) can be configured with dryspin® high helix thread. Feed rates of up to 90mm/rotation can be achieved.

- ▲ Smoother operation with dryspin® high helix thread
- ▼ Ready-to-install system can be configured with 7 dryspin® thread pitches up to a feed of 90mm
- Tested in the igus® laboratory: dryspin® thread Ds20x80, stroke length 300mm, dynamic axial force 400N, speed 7.5rpm, duty cycle 50%. Result: service life of 195,412 double strokes
- 100% lubrication-free and maintenance-free
- 🌐 System configuration online





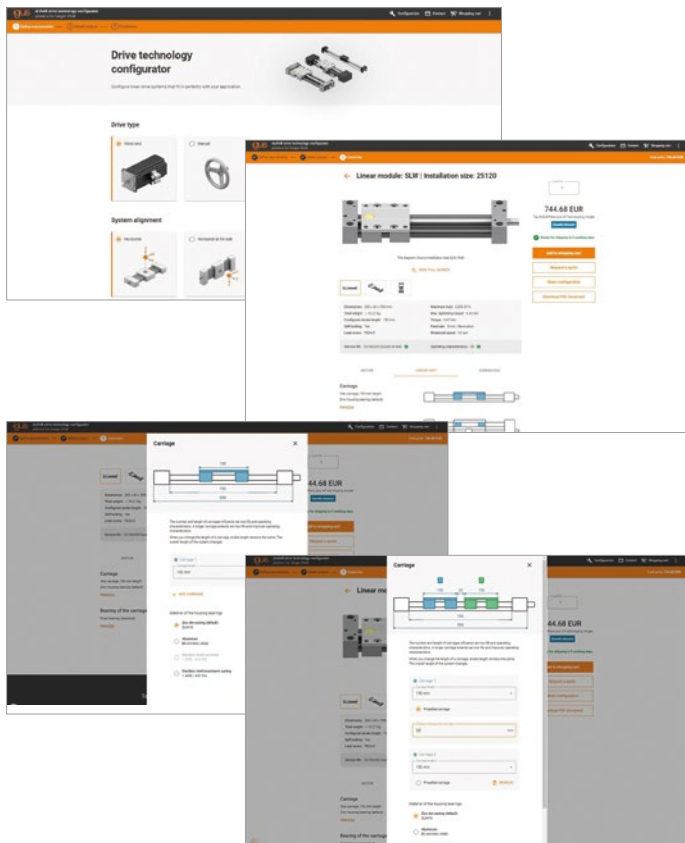
New #smallspace

Compact drive for linear robots

Connection for stepper and EC/BLDC motors and gearboxes

The compact drylin® E-Gantry Drive GD-20 is the ideal connection between two drylin® linear modules or toothed belt axes, e.g. the series of the modular system ZLW-20.

- ▲ The drive is positioned exactly between the axes, the installation space around the axes is free
- ▼ Ready-to-install module for synchronising toothed belt axes and electric motor
- Clearance height suitable for 40x80mm design profiles
- 100% lubrication-free



New

User-friendlier product finder

Drive technology configurator DDX

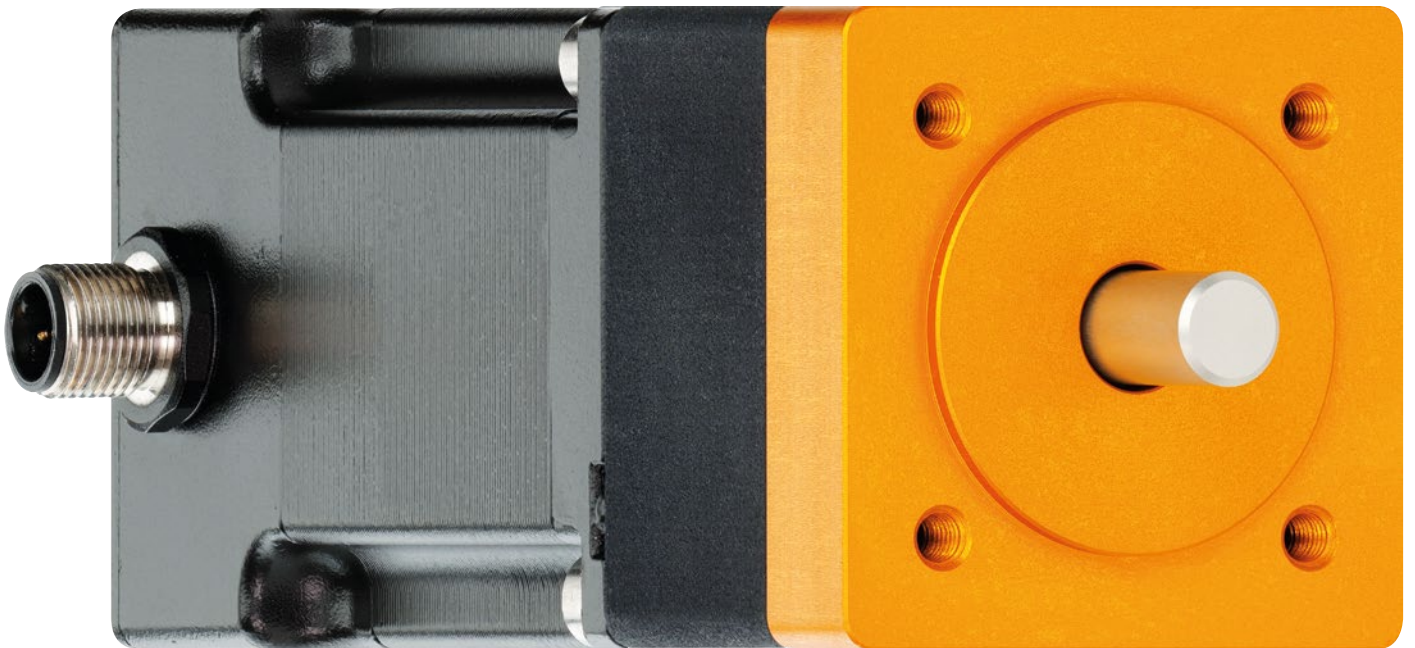
Find the perfect solution for your application: simply enter your requirements and receive suitable configurations.

- ▲ Implement development ideas faster through automatic calculation and combination of individual parts
- ▼ Time saving due to automatic calculation and design in the tool
- Just try it out: igus.eu/ddx
- Online tool supports "lean production" processes from ordering in ERP through production to delivery



drygear® planetary gearbox

Compact, cost-effective, powerful



New #superlowcost

Lightweight with a 5:1 ratio

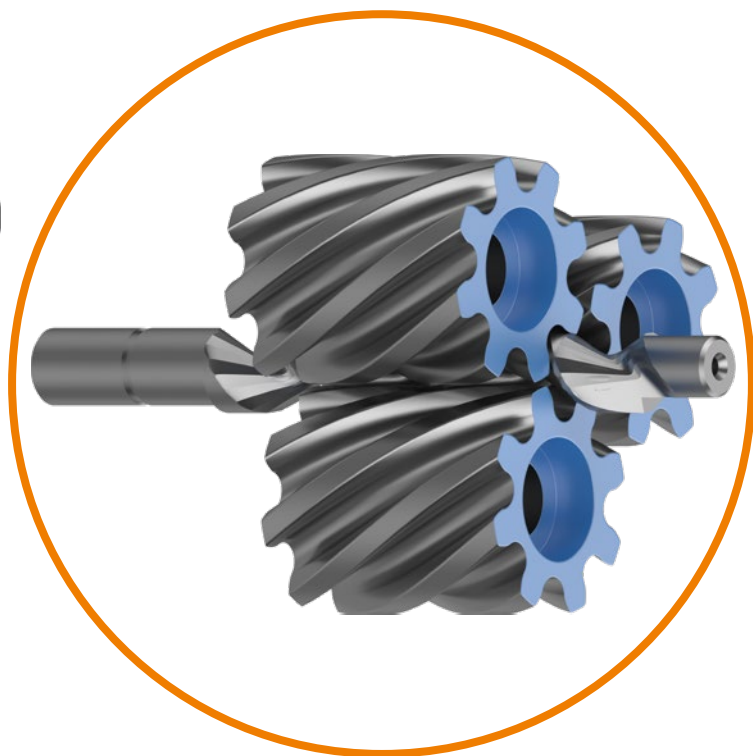
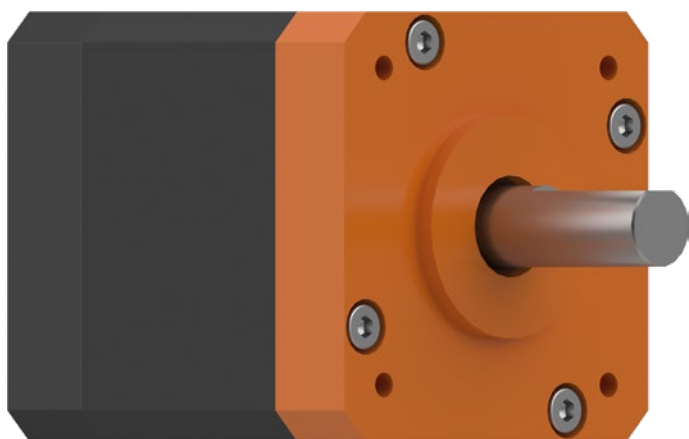
drygear® planetary gear for NEMA23 stepper motors

Plastic planetary gearboxes for NEMA23 stepper motors with a ratio of 5:1 are now available. The gearboxes can be purchased individually or with the igus® stepper motors already installed.

- ▲ Up to four times lighter than metal gearboxes
- ▼ Cost-effective from 1 piece thanks to high plastic components
- Successful tests in the drylin® test laboratory
- Gearbox in dry operation without liquid lubricants



Transmission 18:1 single stage



Study

Powerful thanks to optimised tooth profile

drygear® evoloid gearbox

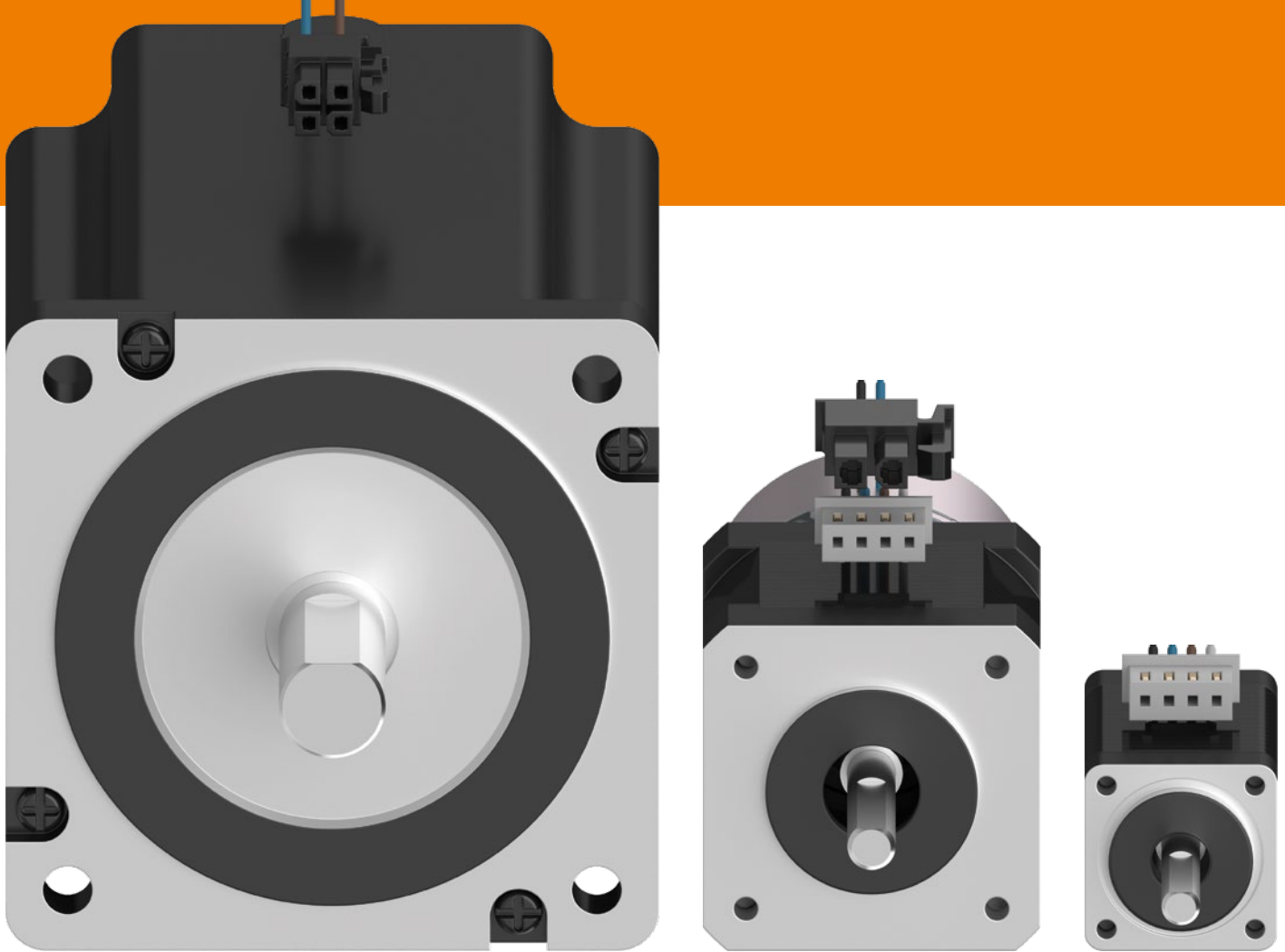
The coaxial drygear® evoloid gearbox for connecting to NEMA17 motors implements the high, single-stage transmission via three planetary gearboxes (instead of two) for greater torques thanks to the optimised tooth profile.

- ▲ High single-stage transmission in a compact design
- ▼ Cost-effective thanks to small number of components
- Successful tests in the drylin® test laboratory
- Gearbox in dry operation without liquid lubricants



Stepper motors with angular encoder and brake

Precise rotation



New #smallspace

The right solution for any motor application

Stepper motors with angular encoder and brake

The new stepper motors are available in different installation sizes so that the right motor can be selected for every application. The motors are also available with angular encoders or brakes.

- ▲ 10 motors for any application
- ▼ Suitable for igus® control systems
- Holding torque from 0.03Nm to 12Nm
- Maintenance-free and CE (EMC) approved
- 🔗 Find the right motor for any application in the online tool: igus.eu/dmx



Making optimum use of electric motors for automation

Automation technology is advancing in leaps and bounds. Anyone who wants to automate a process cannot avoid an electrical movement.

Most applications involve constant motion where speeds, accelerations and loads are known. The appropriate motor must now be selected to match the application. If it is incorrectly chosen, the application will not work and the movements cannot be performed properly or become uneconomical. It should be checked whether a motor encoder is required for a reliable positioning, together with a motor control system. If a machine has to be reliably positioned and as far as possible without any possible failure, a rotary encoder is mandatory. A motor brake is also an important component in vertical applications. Should there ever be a fault in the machine or a power failure, the motor brake will hold the vertical load. The motor brake prevents the machine from being damaged or someone from being injured.

Both the existing igus® motor product range and the new motors cover the described automation requirements. You can choose between inexpensive stepper or DC motors, fast EC/BLDC motors, stepper motors with Protection Class IP65 for splash water areas, stepper motors with a lead screw connection for the medical area or motors with metric connectors for the robust industrial area.

To make selecting the right motor child's play, igus® has developed an online motor product finder: the drylin® Motor Expert (DMX) igus.eu/dmx

The motor product finder makes a pre-selection with only three application specifications for torque, speed and duty cycle. The best choice can then be selected based on utilisation or price. As a further service, the data sheet and EPLAN macros are offered directly in the tool, which help you create circuit diagrams quickly. All motors in the shop are in stock and ready to ship in 24 hours.

Customised motors with adapted motor windings or different torque characteristics can be developed and produced on request.

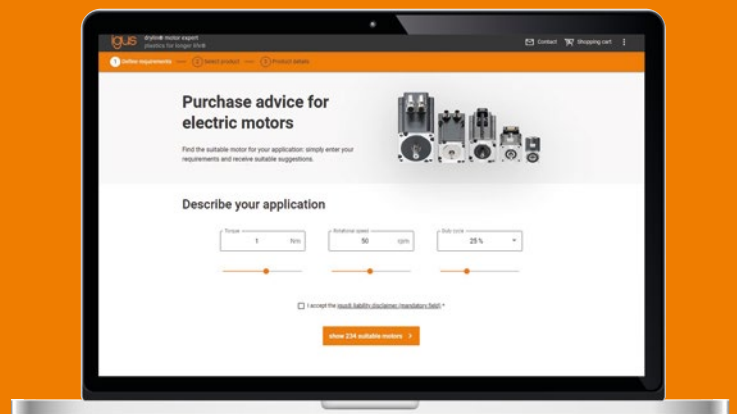


René Erdmann
Head of Business Unit drylin® E

Purchase advice for electric motors

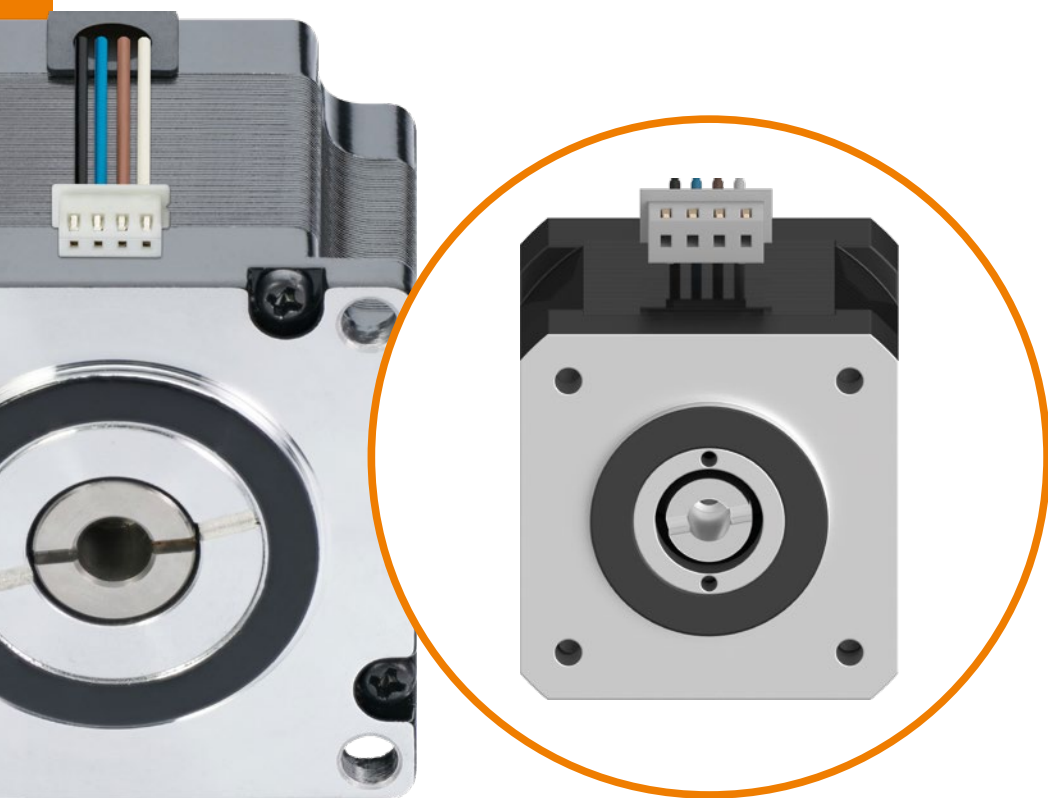


igus.eu/dmx



NEMA14 stepper motors

Space-saving motors



New #smallspace

Stepper motors with lead screw for confined installation spaces

NEMA14 stepper motors

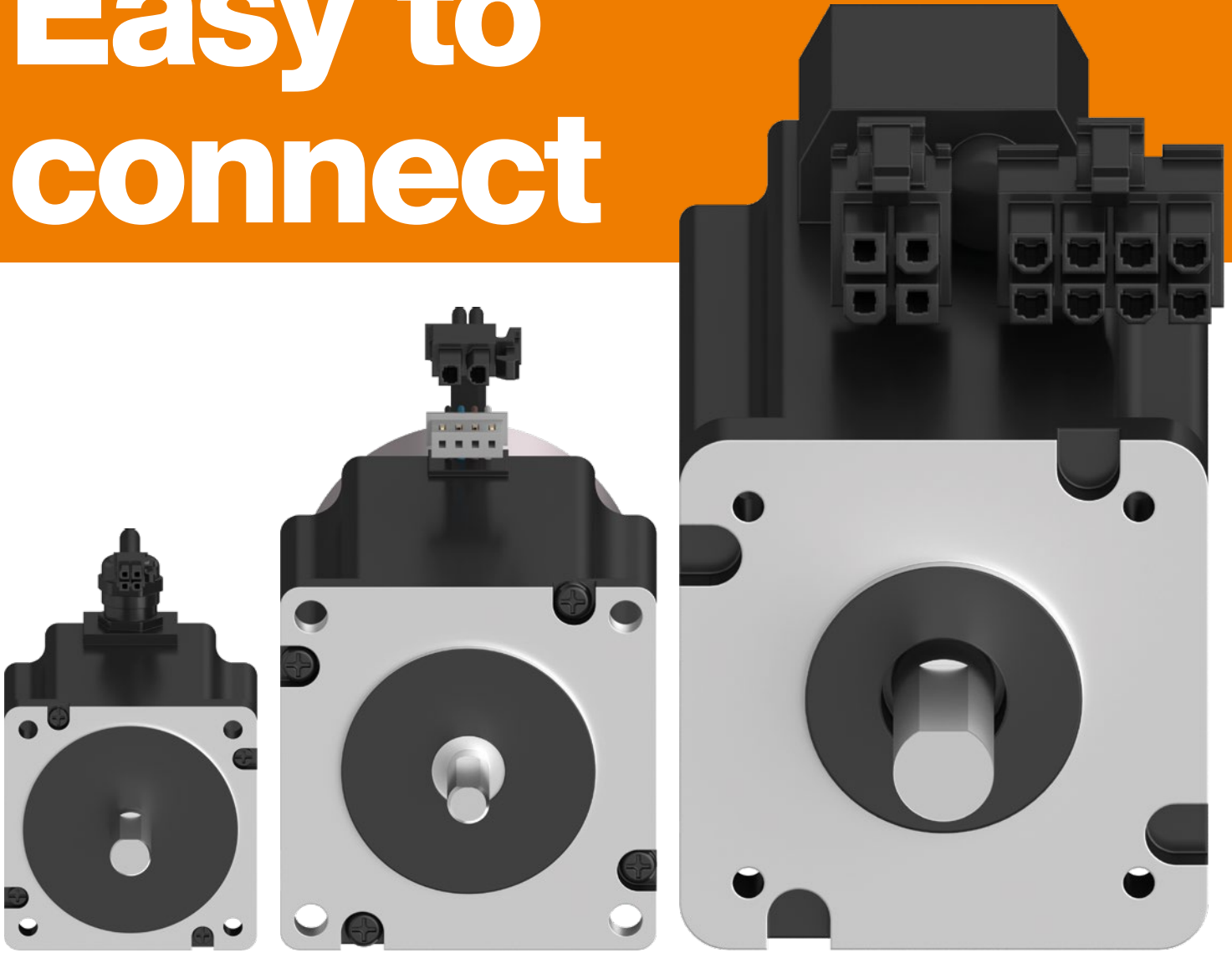
Addition of installation size NEMA14 to the igus® lead screw motor programme.

The series with a 35mm flange is available in two lengths, each with and without an angular encoder.

- ▲ One installation size, two lengths, four motor types with and without angular encoder
- ▼ Suitable for igus® lead screw and control systems
- 15% smaller installation space compared to NEMA17 stepper motors
- Maintenance-free and can run for up to 20,000 operating hours
- 🔗 Find the right motor quickly and easily with the "drylin® Motor Expert" igus.eu/motor-expert



Easy to connect



New

Quick and reliable connection with Molex connector

Motors with Molex connectors

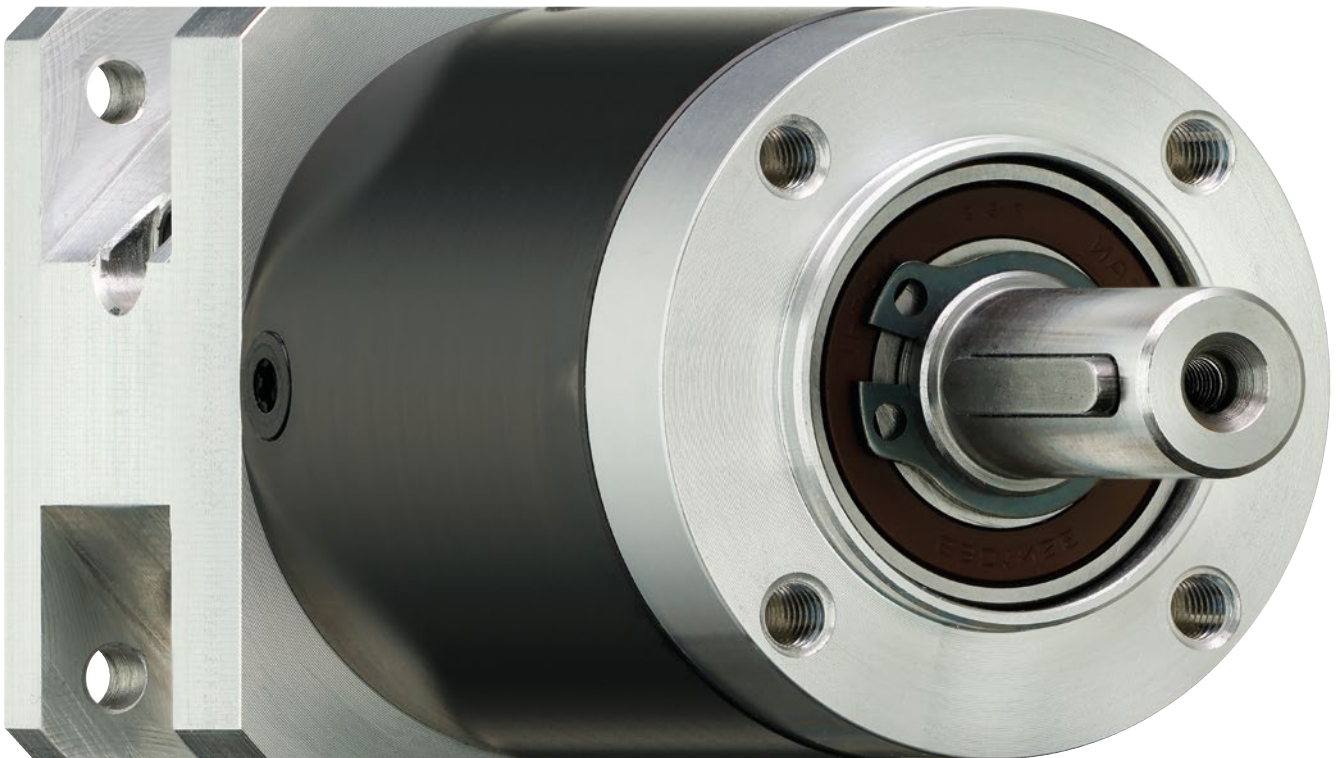
Existing stepper and EC/BLDC motors are retrofitted with Molex connectors to ensure quick and safe commissioning.

- ▲ Standard Molex connectors for quick and secure installation
- ▼ Installation costs are reduced thanks to plug in connections
- 95% faster installation than solder or screw connection
- Maintenance-free and wear-free
- 🔗 Find the right motor for any application in the online tool: igus.eu/dmx



Gearbox in installation size 40

Space-saving, silent, strong



Compact gearbox for confined installation spaces

Gearbox in installation size 40

Compact gearbox for motor applications in confined installation spaces. The small and light gearbox is available in six gear reductions, which are suitable for igus® stepper and EC/BLDC motors. Due to the small gearbox, smaller motors and control systems can be used, which saves costs.

- ▲ Suitable for all igus® NEMA17 stepper & EC/BLDC motors
- ▼ Use smaller, more cost-effective motors in conjunction with gearbox
- 73% more weight savings and 55% less installation space compared to GEA-60
- CE according to ROHS
- 🔗 Further information and sample programmes for various applications online:
igus.eu/sample-program



Control easily and safely



Drives for DC motors

drylin® motor control systems

The new DC motor drive D5 controls DC motors. The broad supply voltage range allows both battery operation as well as industrial operation. The left and right rotation of the motor can be started via simple mechanical buttons and developer boards or PLC.

- ▲ Control DC motors
- ▼ Standardised control system using digital inputs
- 25% more cost-effective than dryve D3 DC motor control system
- CE according to ROHS
- 🌀 90% time savings during commissioning due to iglus® sample programmes



Firmware update for D1 motor control system

Functional additions



New

Save time and reduce cost with the new functions

Firmware update for D1 motor control system

The new firmware update of the D1 includes 11 updates. In addition to a modulo axis, which enables time- and path-optimised movements, there is also the "E-cylinder" function, which allows for an easy replacement of pneumatic drives.

- ▲ 11 Improvements/functions for automation
- ▼ The free update can be loaded on any D1
- Shorter commissioning thanks to tips in the GUI
- Digital product with unlimited multiple use
- 🌐 Available online 24/7



Firmware update for D1 motor control system

The automation market is in constant transition, as both customer requirements and technical possibilities are continuously changing.

If a few years ago it was enough for a motorised drive to be able to move from A to B, it also has to be energy-saving, time-optimised and quiet today.

Furthermore, commissioning must be as quick and inexpensive as possible. To be constantly up to date, a motor control system must be updated regularly.

The D1 was developed eight years ago with digital signal processors and an integrated web server interface, so that it would still be up-to-date years later. This basis allows for regular release updates with new features that work with Google Chrome, Microsoft Edge and Mozilla Firefox.

A new function is the "Modulo axis", which makes time- and path-optimised movements possible on rotary axes. With a 360° rotary axis, the motor control system decides for itself whether to turn left or right so as to go the shortest way.

This is a great advantage if you want to work efficiently, especially for QA or inspection systems with downstream sorting.

The "E-cylinder" function is the simplest movement from A to B using two digital signals. One signal starts the movement to point A and the other signal to point B. This function is known from pneumatic drives, which, however, require too much energy and are therefore inefficient. With the new function, pneumatic cylinders can be replaced with motor drives.

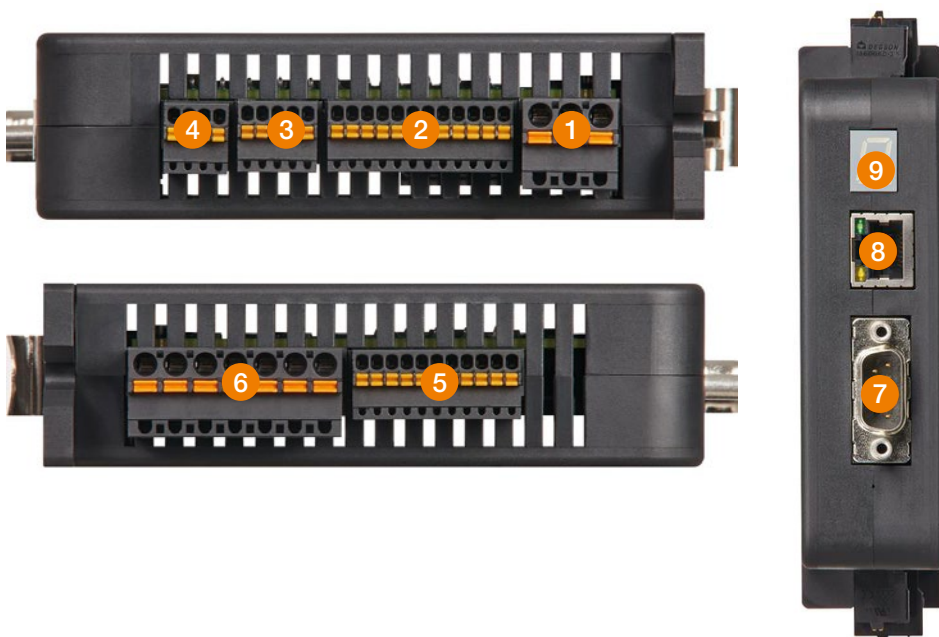
Furthermore, functions that significantly simplify commissioning have been added to the D1. With all igus® motors, all motor parameters are already stored in the motor control system. If a customer-specific motor is to be used, the appropriate motor control parameters can be determined fully automatically with "self-tuning". If you forget to determine or enter the parameters, the motor control system will point out this error. If other application parameters, such as maximum speed or acceleration, have been forgotten, the D1 will also indicate these errors.

Further firmware updates, such as "pulse/direction function" with automatic step resolution to minimise noise, CANopen optimisation for information messages or heartbeat function, have also been integrated.

You will also be able to install further firmware updates on the D1 in future. We look forward to customer ideas and requests, which we can integrate.

Just some of the improvements:

- Modulo axis
- E-cylinder
- Self-tuning
- Pulse/direction function
- CANopen optimisation
- Heartbeat function
- ...



1. Voltage supply
2. Digital inputs
3. Digital outputs
4. Analogue inputs
5. Angular encoder
6. Motor & brake connection
7. CANopen
8. Ethernet
9. Display

Voltage supply for automation

Energy for every movement



New

The suitable nominal voltage

Voltage supply for automation

Choose the right voltage supply for your application from 8 different types.
The product range covers output voltages from 24-48VDC and 2.5-20A currents.

- ▲ Eight different voltage supplies for every application
- ▼ Suitable for igus® control systems and motors
- Voltage range 24-48V and currents 2.5-20A
- Maintenance-free and self-resetting after overload



dryve sample programmes and dryve Experience

Save time and reduce cost



New

Quick commissioning with sample programmes and short videos online

dryve sample programmes and dryve Experience

Good service is essential to keep commissioning times short and reduce costs. Both can be optimised with the igus® sample programmes for the dryve motor controls and the short videos in the "dryve Experience".

- ▲ Functional software integration through sample programmes
- ▼ Lower commissioning costs
- 90% faster commissioning
- Only digital data is available
- 🌐 Sample programmes and videos available online 24/7



LCA | Automation for companies of all sizes

Low Cost Automation



igus.eu/news-LCA

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Tech up



Cost down



Proof



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Digital

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ReBeL® KID

It's a ReBeLution



New #superlowcost

Industrial robots made of plastic in a new size

ReBeL® KID

Small but fine - the ReBeL® is expanding with a smaller version that fits into any installation space thanks to its compact design.

- ▲ Suitable for overhead applications, space-saving thanks to the integrated switch cabinet in the base
- ▼ Less installation space required due to ultra-compact design
- One million test cycles in the Low Cost Automation laboratory
- With a weight of only 4kg, the ReBeL® KID is easy to transport
- 🎯 Simple integration through various sample programs



From Evolution to ReBeLution

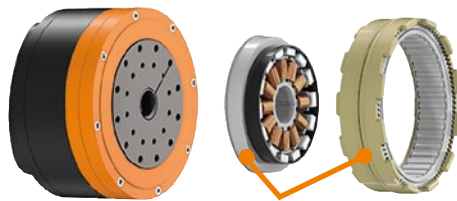
The first industrial robot made of plastic – Improve technology, reduce costs

Agile development approaches that focus on customer requirements are not exclusive to software companies. In mechanical engineering, too, developers and designers are largely dependent on feedback from their customers. The development of the ReBeL[®] is an example of how agile development works at igus[®].

In 2005, the starting signal was given for the development of the first articulated arm robot, the robolink[®] W. The first draw-wire robot from igus[®] was born shortly afterwards. Thanks to its lightweight feature, many customers use it in humanoid robotics applications. The draw-wire robot found its way even in the classic industry, for example on the assembly line of an automobile manufacturer. The successful process optimisation of our customers has motivated us to refine the technology. Repeatedly, we heard the wish to offer a complete system consisting of robot, control system and software. A few years later, the successor model, the robolink[®] DC, was fully developed according to exactly these requirements.

The robolink[®] DC was followed in 2020 by the robolink[®] DP, which is still the best-selling articulated arm robot.

We made the biggest technological leap in 2022 with the ReBeL[®], by which we fully integrated the power electronics into the robot body for the first time. An external switch cabinet is therefore no longer necessary. The use of plastic in robotics is unique and therefore means testing, testing, and testing. But thanks to our expertise in plastic injection moulding, we have succeeded in constantly improving the gearbox technology and switching completely to plastic. After the original draw-wire actuators, a worm gear followed as a direct drive. In the current stage of development, the ReBeL[®] uses a plastic strain wave gear.



Wellgetriebe aus tribologisch optimierten Hochleistungspolymeren

But that's not all: it's a ReBeLution - because the ReBeL[®] is the first robot made entirely of high-performance plastic.

As a result, it weighs just 8kg, making it the lightest in its class. A real lightweight robot.

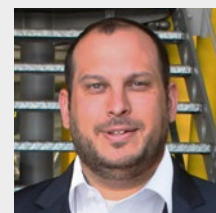
The compact, space-saving design with an integrated control system in the base opens up completely new fields of application for service robotics. In collaboration with people, the ReBeL[®] takes on tasks in the event and gastronomy sector, for example as a reliable coffee enricher.

The ReBeL[®] offers freedom of choice: the robot is available as a plug-and-play version with integrated control system and robot software, or as an open source version. In addition, users can choose between four or six degrees of freedom and thus adapt the ReBeL[®] to their individual application scenario. And with the ReBeL[®] KID, a smaller version of the articulated arm robot will also be available from 2023.

Such a ReBeL[®] needs the right environment and the right accessories to continue to modify the (robot) world. Thanks to customer feedback, we have developed new equipment elements. We call these elements of the working environment the ReBeL[®] Environment. We invite you to get to know the world of the plastic robot on the following pages!



Fully integrated ReBeL[®] strain wave gear
Page 149



Alexander Mühlens
Head of the Low-Cost-Automation
Business Unit



New

Cobot testing

ReBeL® Environment

You can use the ReBeL® as a cobot, i.e. for collaborative work with a human.

- ▲ Testing according to TS15066 2017:4
- ▼ No security fence necessary
- Testing by the Institute for Occupational Safety
- Protects people from physical harm



New

Cobot workstation

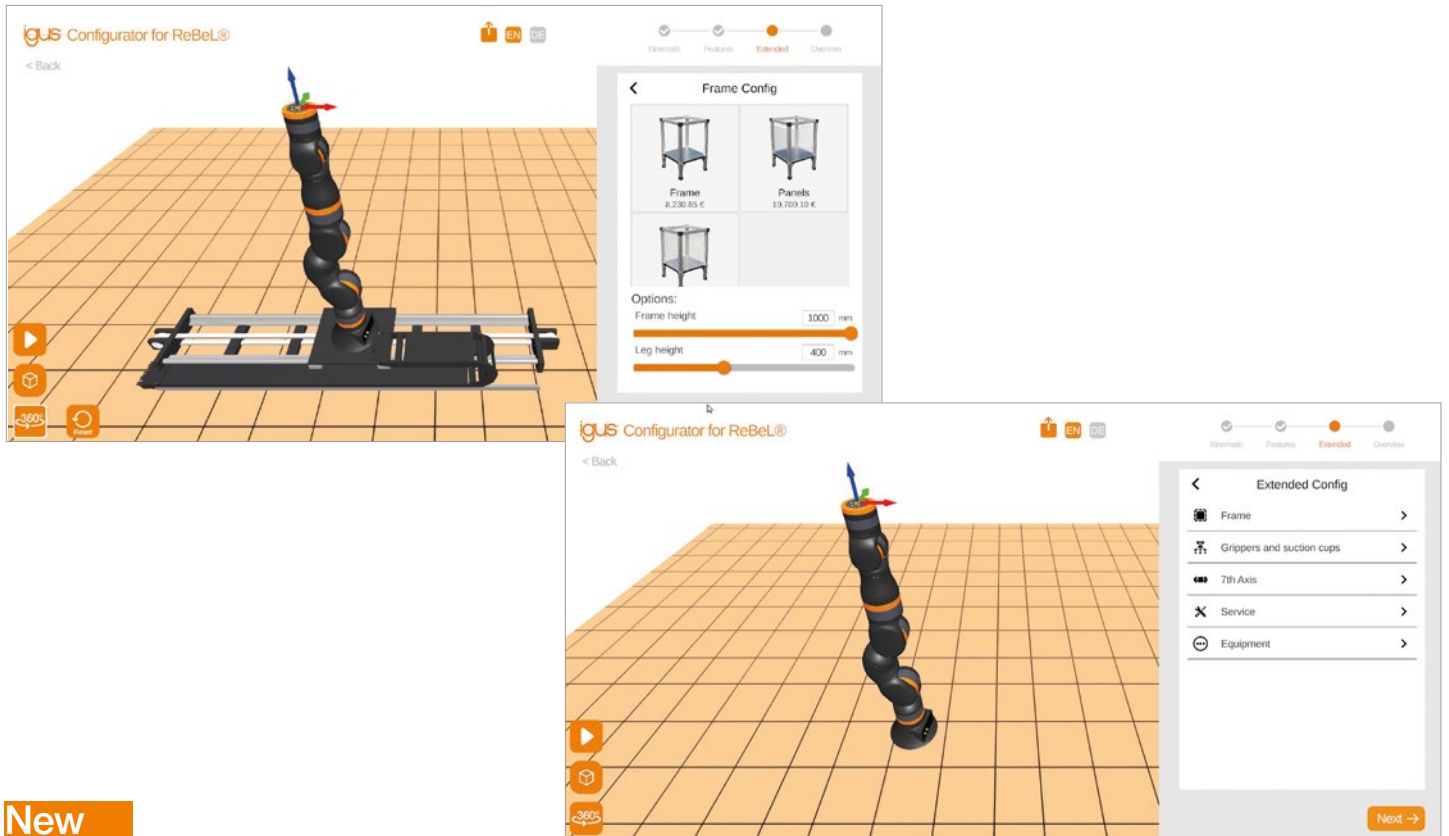
ReBeL® Environment

The finished work table for the ReBeL® offers space to program applications with additional accessories such as conveyor belts and grippers.

- ▲ Prepared work area: set it up and start programming straight away
- ▼ Built up modularly on T-slot profiles
- Extensively tested in the Low Cost Automation test laboratory
- Save resources, because individual structures are no longer necessary



Configure cobot



New

Configure cobot environment

ReBeL® Environment

Configure the working environment of your ReBeL® articulated arm robot exactly as you need it for your application: with grippers, energy chain, 7th axis and robot cell.

igus.eu/rebel-configurator

- ▲ Assemble compatible components with just a few clicks
- ▼ Configure complete ReBeL® accessories within three minutes
- Real-time price display provides full cost transparency
- Avoid annoying returns and order matching accessories directly
- 🎯 Conveniently assemble the ReBeL® environment from anywhere

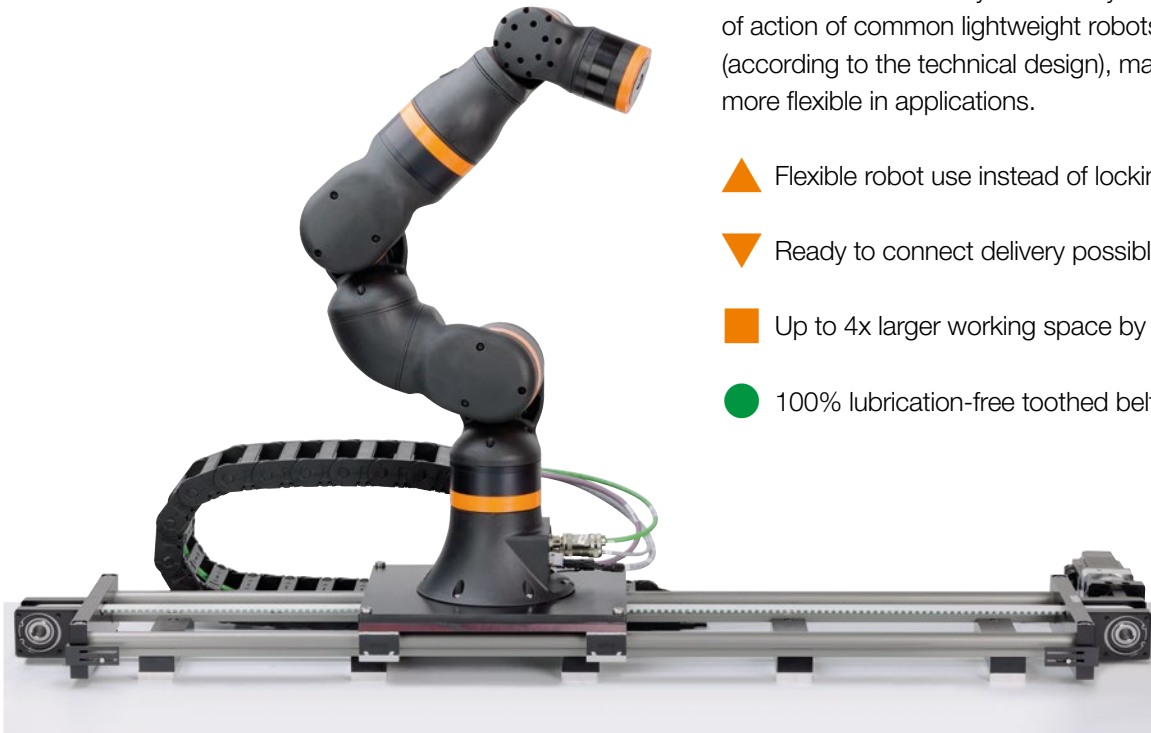


New

Flexibility on the 7th axis

ReBeL® Environment

Your individual extension for more work space. Our 7th axis can be used individually and flexibly. It expands the radius of action of common lightweight robots by up to 6,000mm (according to the technical design), making them much more flexible in applications.



- ▲ Flexible robot use instead of locking kinematics
- ▼ Ready to connect delivery possible
- Up to 4x larger working space by using the 7th axis
- 100% lubrication-free toothed belt axis



New

#superlowcost

Mobile cobot with integration kits

ReBeL® Environment

The ReBeL® is now mobile and is conquering new spaces on an Automated Guided Vehicle (AGV) such as MiR and Trurunner or as individual ROS 2 Integration.



- ▲ Controllable with ROS and igus® Robot Control
- ▼ The world's most cost-effective combination of AGV and cobot
- Extensive testing in the Low Cost Automation test laboratory
- Saves unnecessary trips, electrical energy supply

2



Industrial robotics for training



New

Education kit

ReBeL® Environment

The education kit is a fun way to get started with robotics. Program a realistic cobot based on factory scenarios with the ReBeL® or the ReBeL® KID.

- ▲ Flexible, compact and maintenance-free set with real reference to reality
- ▼ Cost-effective tribological plastic cobot, free and license-free software
- One million test cycles in the Low Cost Automation test laboratory
- 100% lubrication-free robot, can be used in groups
- 🎧 Free didactic learning material for students and teachers, tutorial videos for programming





New

Custom robot protection

ReBeL® Environment

The tailor-made solution for robot protection in the fields of painting, powder coating, food handling and many more ...

- ▲ Protects the robot from external influences such as dust or dirt
- ▼ Easy to retrofit
- Tested for splash water and dust
- The same robot can be used in different application areas



New

Fit flexibly

ReBeL® Environment

The new ReBeL® BASE makes it possible to quickly and easily fix the ReBeL® in a new place, e.g. on your desk or a workbench.

- ▲ Versatile
- ▼ No time-consuming assembly
- No drill needed, with quick release
- Fast, easy replacement



ReBeL[®] polymer strain wave gear

Individual, fully integrated



For individual kinematics – „Build your robot“

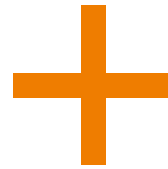
ReBeL[®] Environment

Put together different kinematics from the ReBeL[®] individual gears according to your ideas.

- ▲ Weight-optimised by up to 25% thanks to igus[®] high-performance polymers
- ▼ Integrated control systems in the single gearbox, software prepared for single drive
- Tested in our Low Cost Automation laboratory
- Completely self-lubricating



Plug and play gripper



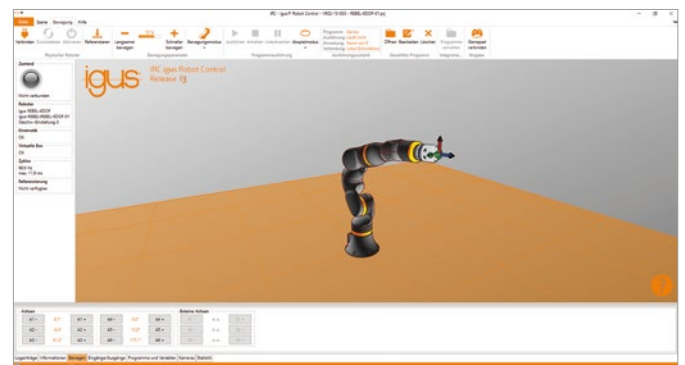
New

Simply mount the ReBeL® gripper

ReBeL® Environment

Different grippers with cable set, adapter plate and software integration.

- ▲ Easy and quick replacement of grippers
- ▼ Own integration not necessary
- Two years and over 2,000 customer tests
- Less use of resources, get started right away



New

Sample programs and integration

ReBeL® Environment

The integration of the ReBeLs® is made even easier with sample programs and voice control system via Amazon Alexa.

- ▲ New sample programs for ROS, ROS 2, Java Script, Ethernet, CANopen and Unity Package
- ▼ Reduce time and costs with easy integration
- Tried and tested in the Low Cost Automation test laboratory and already in use by customers
- Saves development resources



New

ReBeL® Cobot Spot Light

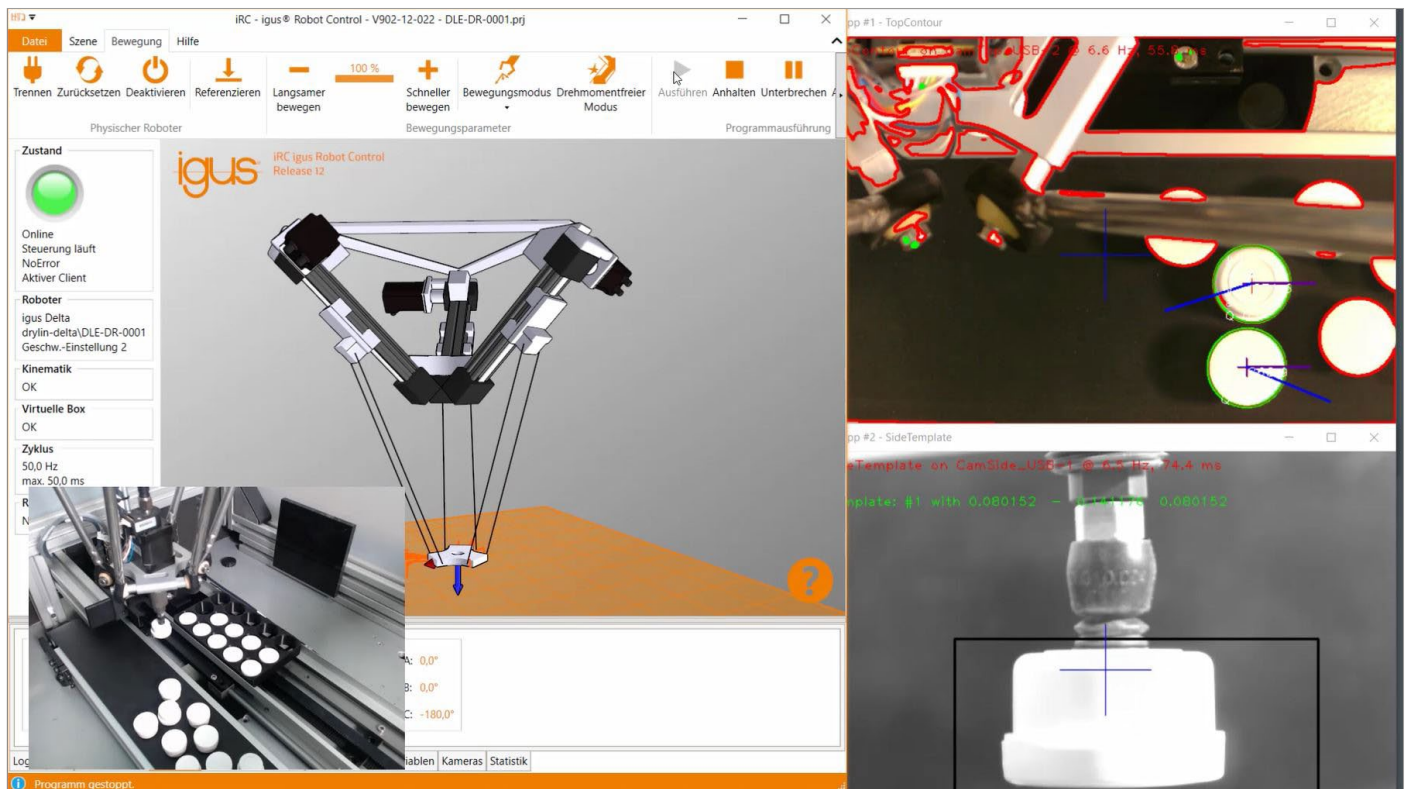
ReBeL® Merchandise

Who doesn't like to sit in the glow of this friendly cobot? The ReBeL® is now also available as a lamp.

- ▲ Articulated arm lamp for flexible light distribution
- ▼ Original gift, previously unsaleable
- Made of tribologically optimised plastic
- Energy-saving LED technology



Program in five minutes



New

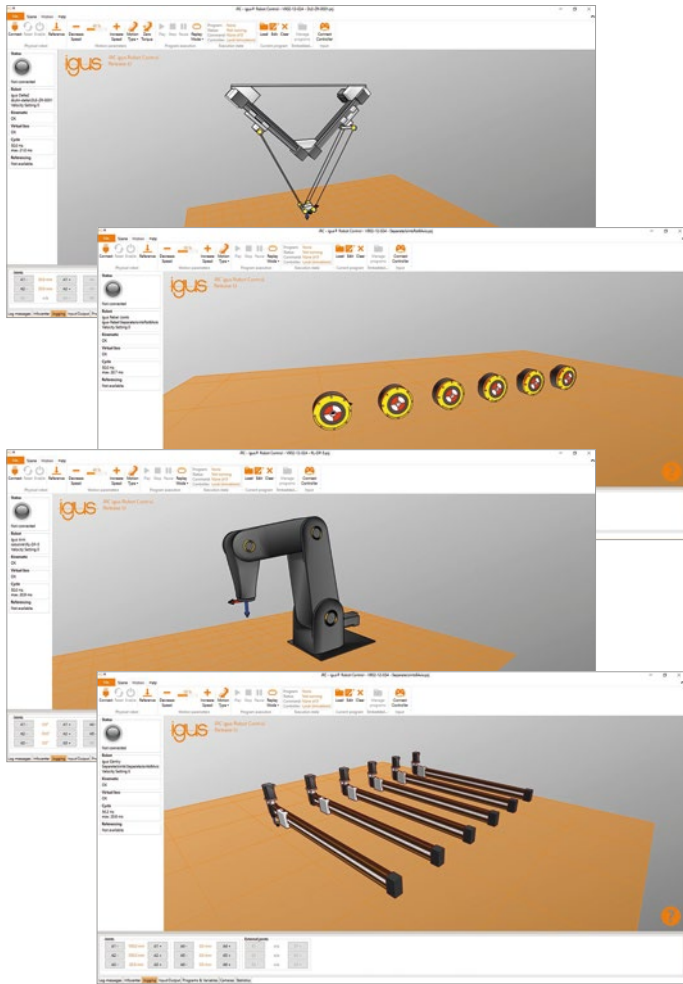
MPick a cost-effective USB camera from the conveyor belt

igus® Robot Control software

Camera integration directly in the software. Use the igus® Robot Control software to program the camera system for your application now. Intuitive and reliable as usual.

- ▲ Fast and cost-effective solution for vision integration
- ▼ Use of cost-effective USB cameras from various manufacturers
- Graphic configuration directly in the igus® robot control software: www.igus.eu/irc-video
- Continuous expansion with new functions
- 🎯 User-friendly and licence-free software simplifies robot programming





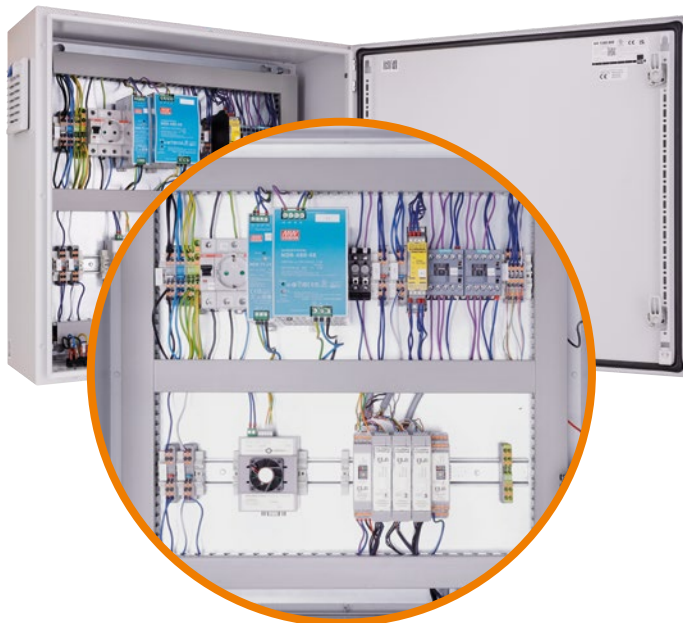
New

Create your own apps now

igus® Robot Control software

Now new with dxf import directly into the control system, workpiece coordinate systems and an app interface for the integration of additional functions. You also benefit from faster uploads and downloads of robot projects.

- ▲ New with direct dxf import, app interface
- ▼ Play before you pay: test robot software in advance for free
- Over 2,000 new software users every year
- One software for all robots
- 🌐 It has a free cloud connection



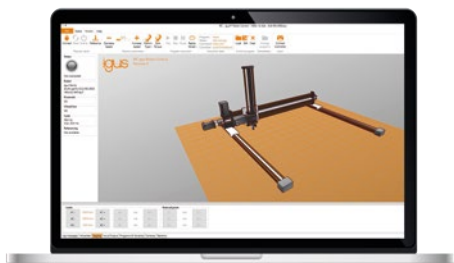
New

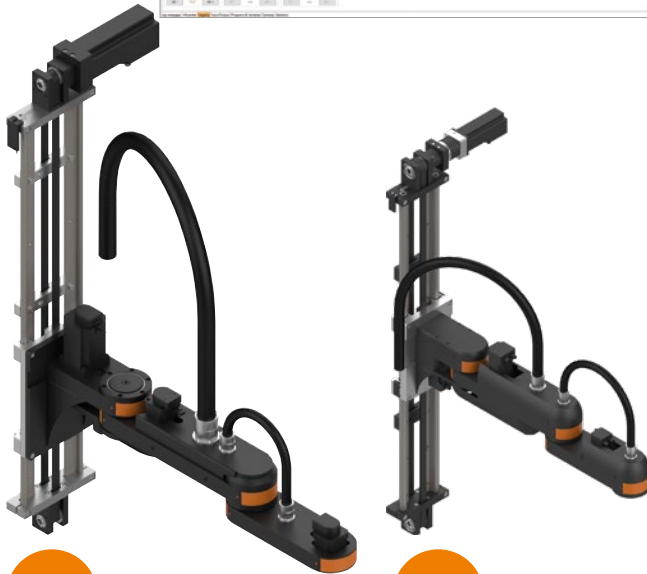
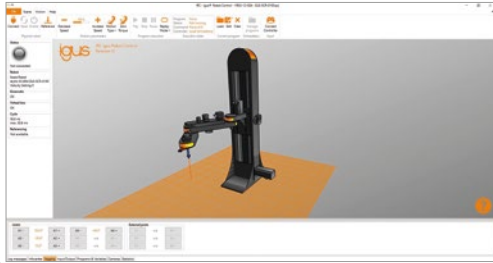
igus® Robot Control for BLDC motors

igus® Robot Control hardware

More power and higher speed: the igus® Robot Control supports BLDC motors, e.g. for palletising robots.

- ▲ For applications with dynamic movements and higher motor speeds
- ▼ Test before you invest: send us your robot task and we will test it together
- Use of the closed-loop control system in the in-house igus® factory
- Continuous expansion with new functions
- 🌐 User-friendly and license-free software simplifies the programming of the robots





mm 600mm

mm 470mm

kg Load capacity: 3kg

kg Load capacity: 2kg

New

Fast, flexible and easy to configure

SCARA robot in new L size

SCARA robots in sizes M (470mm working area, 2kg payload) and L (600mm working area, 3kg payload).

- ▲ Increase reach
- ▼ Harnessable robots, different lengths and IP protection classes
- Reduce integration effort and receive software directly adapted to robots
- Lubrication-free



mm 320mm

kg Load capacity: 0.5kg

New

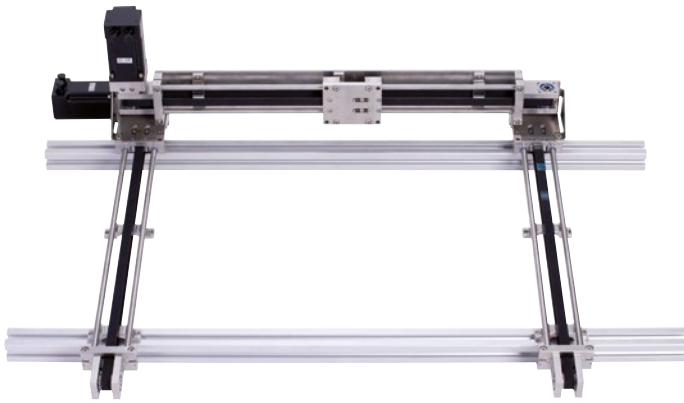
SCARA robot for laboratory applications

Apiro® SCARA robot

The new Apiro® SCARA especially for laboratory applications ensures reliable use. Thanks to the compact design and quiet operation behaviour, the SCARA robot is perfect for desktop applications. The robot can lift a weight of up to 0.5kg.

- ▲ Space-saving in desktop design
- ▼ Test before you invest, robot can be controlled directly in free software
- Gearbox performance data determined in comprehensive testing
- 100% maintenance-free due to incorporated solid lubricants
- 🔌 Plug & Play solution with the igus® Robot Control





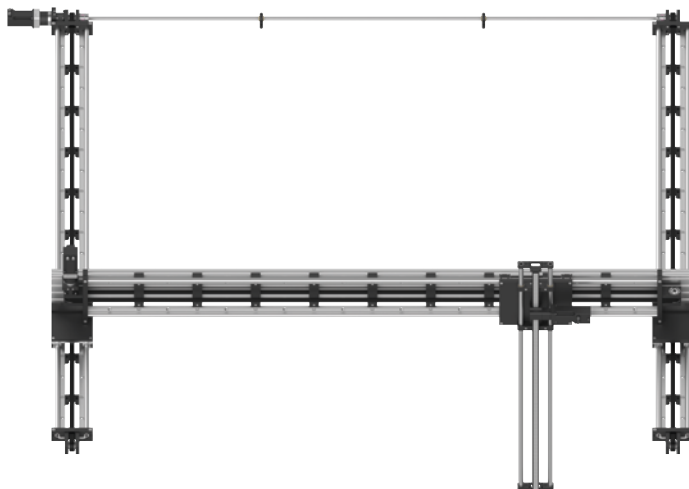
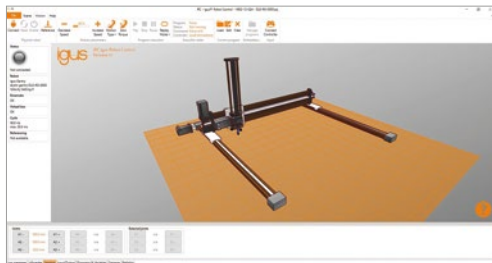
#food

Robust and durable even at high humidity

Stainless steel gantry

For high standards of cleanability, corrosion resistance and durability under adverse conditions thanks to stainless steel components.

- ▲ Long service life in adverse environments
- ▼ Fast throughput to quote generation with our linear robot configurator
- Technical design including service life statement available
- 100% clean operation



Size: 2,000mm x 2,000mm



Load capacity: 10kg

New #heavyduty

Loading and unloading pallets

Palletising linear robot DLE-RG-0004

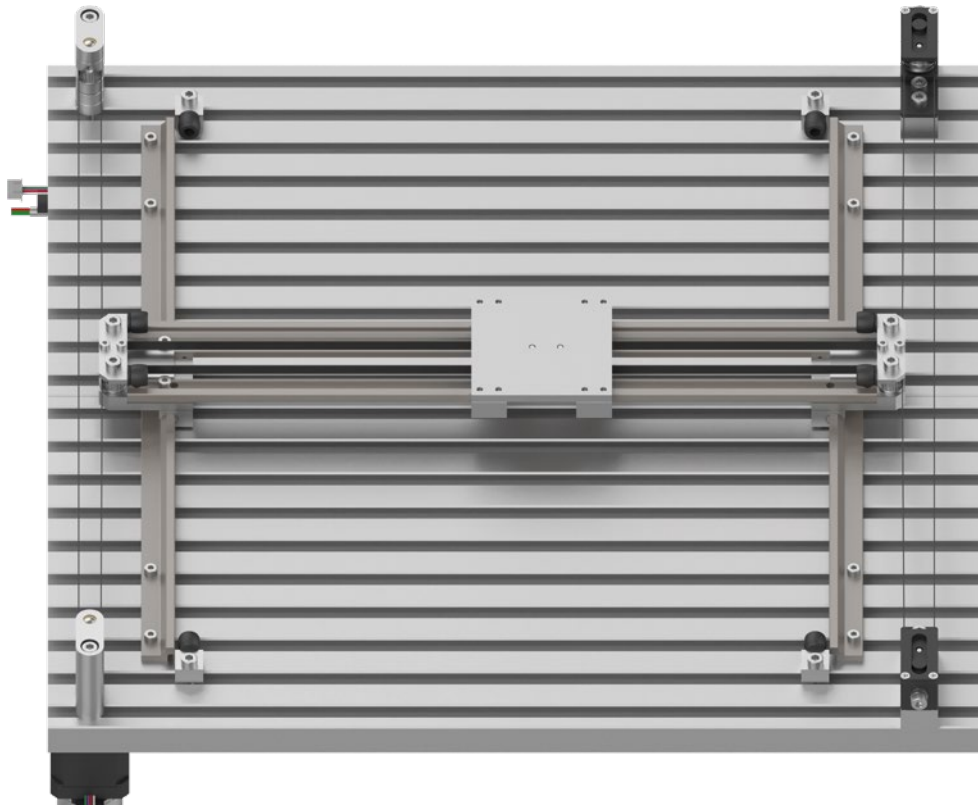
The new standard linear robot system especially for palletising applications ensures reliable and flexible loading and unloading of pallets. The room linear robot can lift a weight of up to 10kg and is thus our strongest room linear robot.

- ▲ Workspace can be configured
- ▼ Up to 60% more cost-effective than conventional linear robots
- igus® linear robots consist of drylin® linear axes, which have been in use with our customers for over 25 years
- 100% maintenance-free due to incorporated solid lubricants
- Plug & Play solution with the igus® Robot Control



H-Bot

Individual robots



New #smallspace

Minimum installation space

H-Bot

The H-Bot displays its strength where it gets tight and makes adjustment tasks possible in the smallest of installation spaces. Talk to us about your individual project.

- ▲ Particularly compact, maintenance-free design thanks to the use of tribologically optimised plastics
- ▼ Individually configurable structure completely as a plug and play version
- Extensively tested in the Low Cost Automation test laboratory
- Minimum use of resources thanks to space-saving design



Individual low-cost robots with no minimum order quantity

From idea to integration in three weeks

Automation solutions have to adapt to the individual company processes. A standard system can often, but not always, meet all requirements. These cases require special solutions that are affordable and based on uncomplicated technology. Low Cost Automation follows the approach of modular robotics, which enables customers to derive their specific solution from a modular system and put it together with flexibility. In short: the technically perfect solution at the lowest price.

Personal support from the beginning

Whether by on-site visit or video call, you will receive personal support for your automation solution right from the start. You will also have the opportunity to test the feasibility of your individual application in advance. According to the "test before you invest" principle, more than 2,000 customer-specific use cases are tested in the customer testing area in Cologne every year. Because the most cost-effective robot is useless if the integration becomes too expensive.

Project planning and quotation

Has the feasibility of your application been checked? Does the technical concept stand? You will then receive an offer with a target price and a CAD model of your special solution within a few days. That's right, up to this point the entire service is free of charge for you.

Prototyping

For more in-depth tests and preparation for a possible high-volume production, you will receive a prototype on request. The service includes control software, individual electronics and design up to the plug-and-play machine. The prototype, like all igus® robots, is developed and manufactured in Cologne. On a production area of 32,000m², igus® pools know-how



across the entire vertical range of manufacture. In this way, you will receive comprehensive and, above all, fast support.

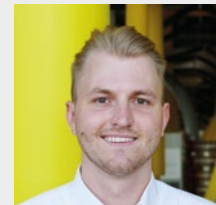
Integration into your processes

From commissioning to the integration of individual components to the safety acceptance of your robot: you are not on your own even in the last step of your automation project. An international integrator network gives you access to experts who are familiar with igus® products. Each integrator brings experience in the implementation of end customer projects and is tried and tested in cooperation. Of course, you can also do the integration yourself.

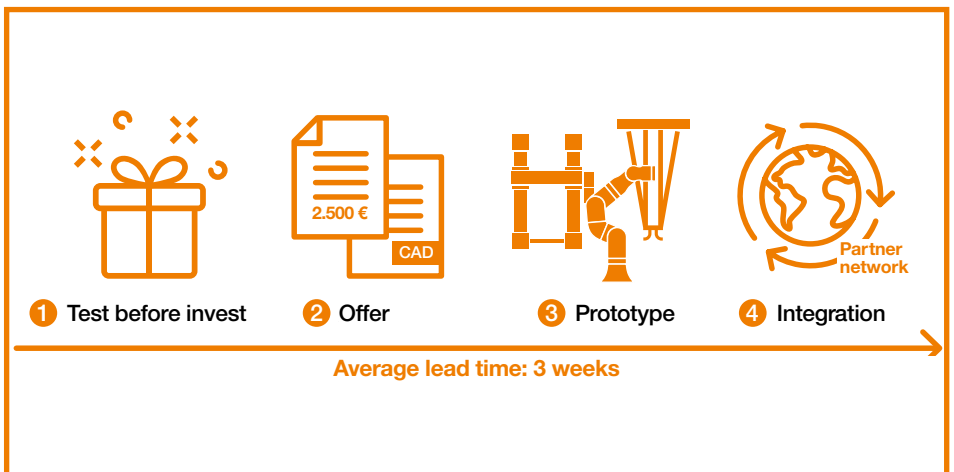
Quick start for your automation project

You are used to very fast delivery times from the igus® standard kinematics. This service is also available for your individual robot. Depending on the degree of customisation, a project lasts between three and six weeks.

We look forward to cooperation!



Julian Ruwe
Internal Sales
Low Cost Automation





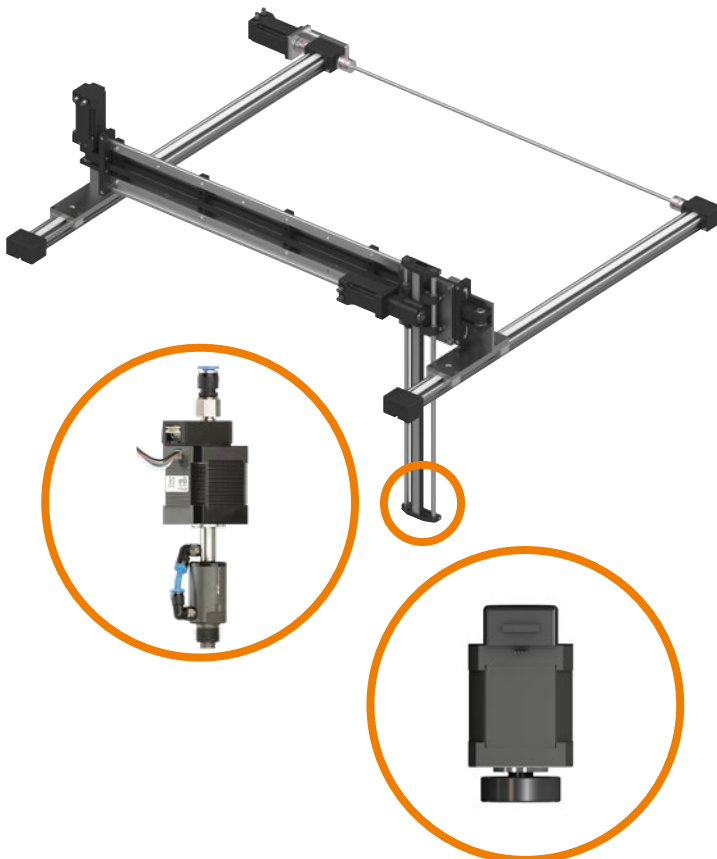
New

Quick pick & place

Lift/Swivel unit for laboratory automation

The lift/swivel unit enables fast and precise handling, especially in laboratory automation, for example for pipetting tasks.

- ▲ Compact and maintenance-free thanks to the use of plastic sliding elements
- ▼ Everything from a single source, complete assembly or with control system
- 10 million test cycles with 500g load in the Low Cost Automation test laboratory
- Less energy consumption, the kinematics are exceptionally light thanks to the use of plastic and aluminium components



With additional degree of freedom

Rotary motor units for linear robots

An option for all applications requiring an additional degree of freedom. An additional rotary movement can be added to the linear movements.

- ▲ Rotary axes with stepper motor technology can be integrated directly into the igus® Robot Control
- ▼ Saves time when an additional degree of freedom is integrated
- Systems already tested extensively in the igus® laboratory
- Lubrication and maintenance-free

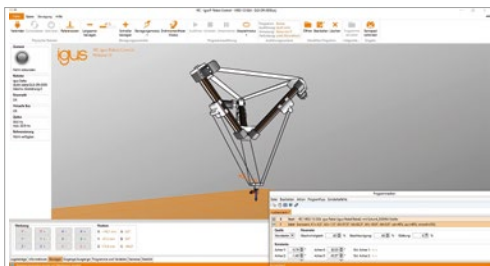
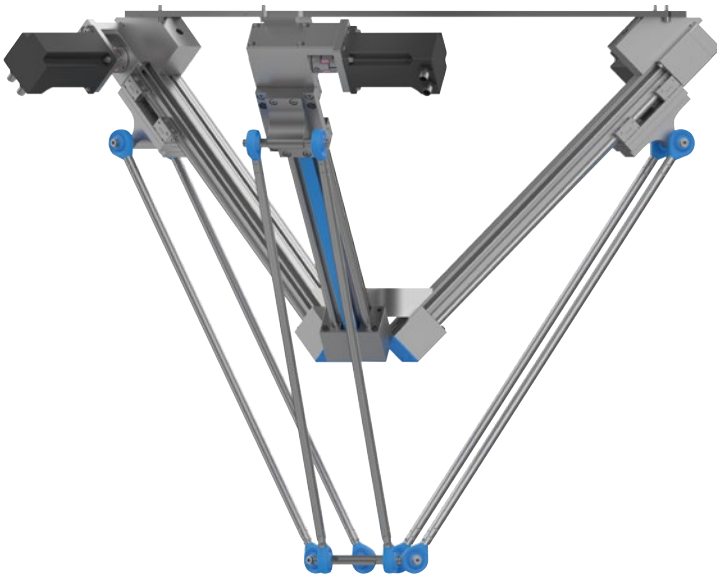


Delta robot with FDA-compliant components

Delta robot with 3 axes

igus® delta robots were developed specifically for pick-and-place tasks. With you, we can continue developing the standard robots for food applications.

- ▲ Bearing points FDA-compliant through iglidur® A160
- ▼ No additional shielding necessary
- Pick rate of 100/min due to low-weight components made of plastic and aluminium
- No washing out of grease and oil in the cleaning process



Practical robotics training

Teaching tools for schools and universities

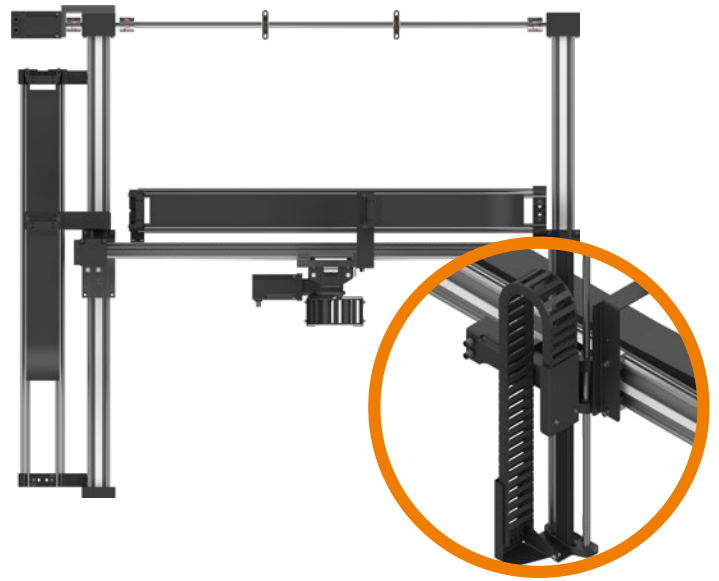
Now you can also use affordable industrial robotics for training. igus® products are CE-compliant and therefore correspond to the applicable safety standards. Use our teaching materials such as tutorials and exercises.

- ▲ Training packages consisting of robot, cell and teaching material
- ▼ Can be ordered individually or as a complete solution
- Thousands of robotics applications with university or school backgrounds
- Multiple and individual use
- 🎧 Free learning material and video media library



Suitable equipment

Accessories for igus[®] robots



New

e-chains[®] kits for all linear, delta and multi-axis articulated robots

Energy chain set for robots

The energy chain (also called e-chain[®]) is a machine component that guides and protects flexible cables and hoses. This reduces downtime and increases the service life of cables and hoses. Save time and money when purchasing and using igus[®] energy chains.

- ▲ Cable-friendly due to very smooth contours
- ▼ No additional design effort thanks to ready-made kits for different kinematics
- Calculate e-chains[®] service life and request certificate
- Have your energy chain processed as part of the igus[®] "change recycling programme" no matter which manufacturer it came from
- 🎯 CAD data for all igus[®] e-chains[®] available online





Robot cells with CE documentation

Robot cells for all igus® robots

The robot cell made of aluminium profiles is designed for all types of robots. The scope of delivery includes the necessary electronics such as emergency stop, start and stop display and CE documentation.

Size: 1000mm W x 880mm D x 2010mm H.

- ▲ Robot mounted and aligned directly
- ▼ Robots and robot cells straight from a single source
- Cells are used in the Low Cost Automation laboratory and in the igus® factory
- 100% lubrication-free and maintenance-free



New

Extra large robot cell

Robocube L or your individual cell

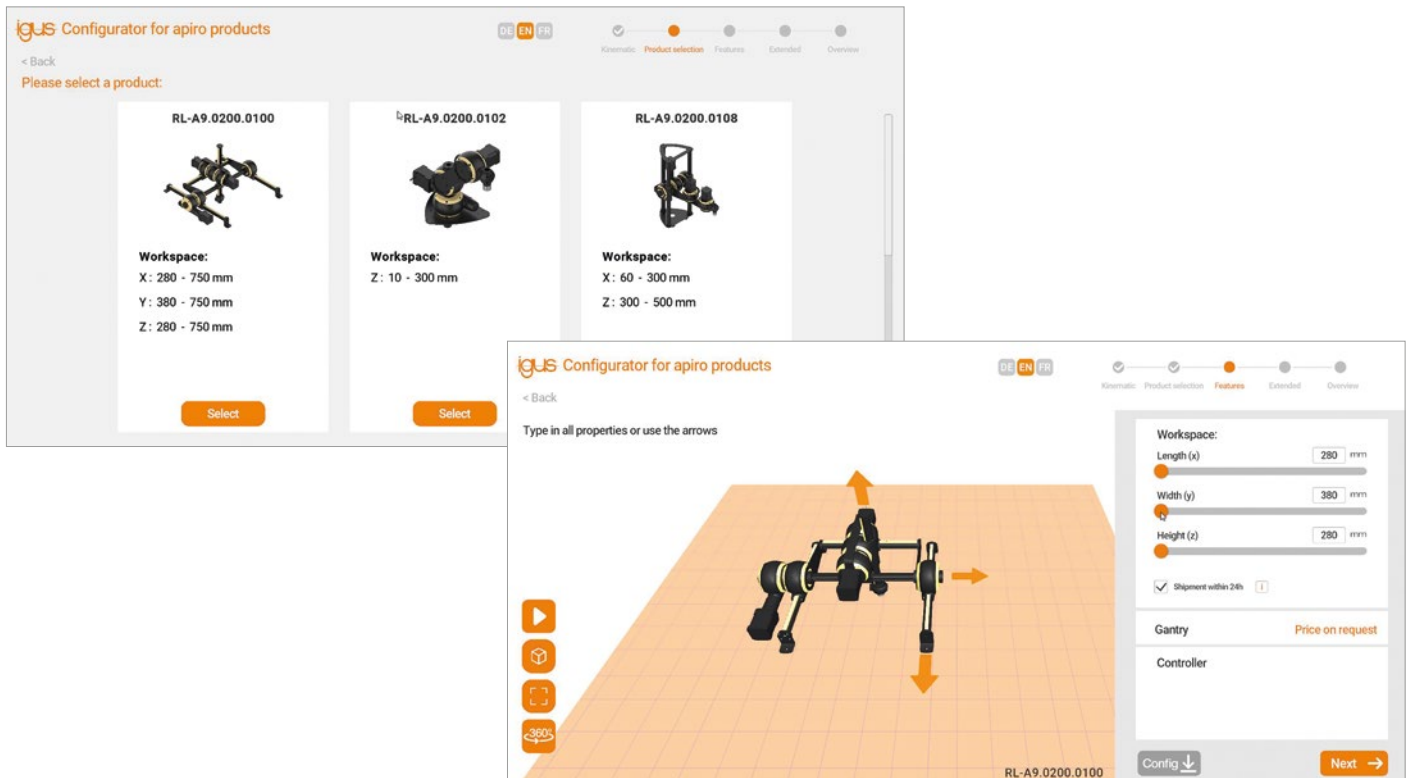
The Robocube in size L now offers even more space for your robot.

Size: 1,600mm x 880mm x 2,010mm (W x D x H)

- ▲ Robot cells with safety technology and CE documentation
- ▼ No independent design required
- Cells are used in the Low Cost Automation laboratory and in the igus® factory
- The cells can be expanded as required with construction profiles



Configure robots intuitively



New

Configure up to eight robot systems online

Apiro® configurator

With the online configurator, eight different robot kinematics can be adapted to individual requirements - always keeping an eye on the live price: igus.eu/apiro-configurator

- ▲ Endless combinations and individual kinematics can be implemented
- ▼ Save time with 24/7 online product advice
- All technical data and information at a glance
- Saves extensive print advertising materials
- 🎯 Put together an individual modular system with five clicks





New

Know where you stand

Digital position indicator for Apiro® gearboxes

From now on, all worm gears of the Apiro® modular gearbox system can be equipped with a digital position indicator including hand wheel and manual clamp.

- ▲ Display of output speed or feed of connected Apiro® rack gears possible
- ▼ As a standard component, it can be combined with all worm gears in the modular system
- Already in use for format adjustment in the packaging industry
- Addition to our lubrication-free modular gearbox



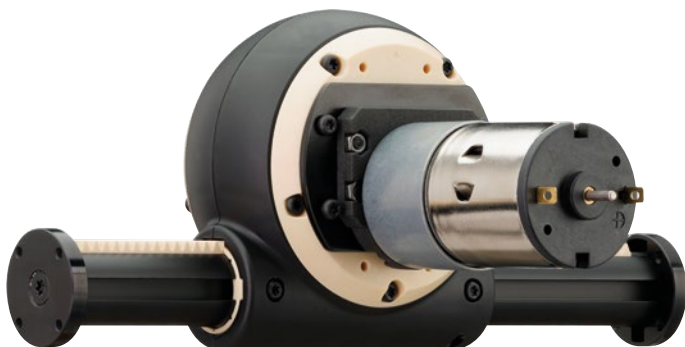
New

Compact drive unit for pusher tasks

DC motor kits for rack gears

The Apiro® rack gears can be driven directly by a DC motor via an integrated planetary gear.

- ▲ Suitable for very small installation space
- ▼ Ready-to-install solution replaces complex construction
- Numerous applications have already been successfully implemented
- Thanks to the dry-operating gearbox, no lubricating greases are required



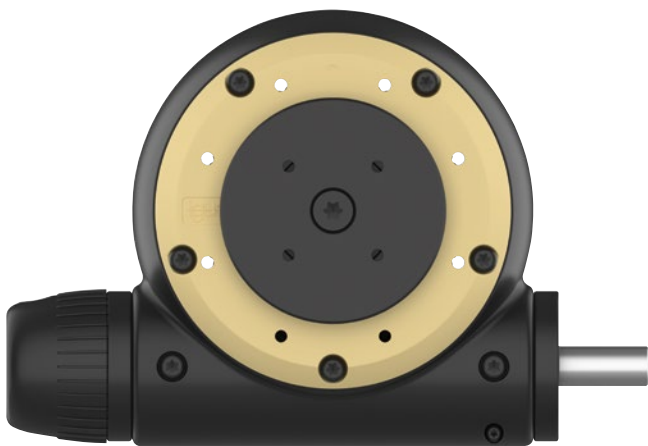
Study

More power in the Apiro® modular gearbox system

Apiro® worm gear in installation size 30

Installation size 30 generates higher output torques by a factor of two than installation size 20. As usual, a flexible drive design and output is possible.

- ▲ Solutions for applications $>2.5\text{Nm}$ in the Apiro® modular gearbox system
- ▼ Cost-effective gearboxes thanks to high plastic content
- Further development of the successful installation size 20
- Thanks to the dry-operating gearbox, no lubricating greases are required



Turntable on both sides

Apiro® worm gear with turntable

Worm gears with turntables are often used for rotary table applications. The turntable on both sides enables symmetrical force transmission.

- ▲ Symmetrical power transmission possible thanks to turntables on both sides
- ▼ Can be combined with the modular Apiro® gearbox system
- Gearbox performance data determined in comprehensive testing, e.g. RL-A10.0210 up to 2.5Nm or RL-A10.0209 with up to 80rpm
- Wear-resistant parts are replaceable





Powerful lift/push drive

Apiro® lift/push drive

The Apiro® lift/push drive is used for height adjustments or pusher applications. Several gearboxes can be easily synchronised.

- ▲ Greater power transmission than the Apiro® cantilever axis by a factor of five
- ▼ Can be combined with the modular Apiro® gearbox system
- Gearbox performance data determined in comprehensive testing, e.g. RL-A18.0101 up to 250N in vertical installation position
- Wear-resistant parts are replaceable

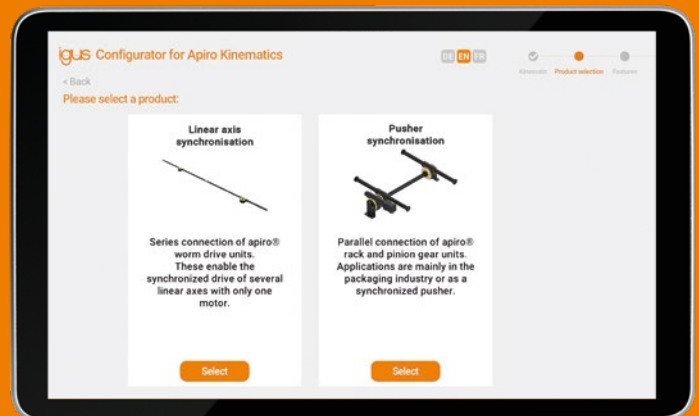


Configurator for Apiro® kinematics

Design of systems with multiple gearboxes

Synchronised rack gears and synchronised drylin® linear axes can be configured in no time at all over a length of up to 5,000mm.

The input of technical parameters enables the technical review of the system in the course of preparing the quotation.



igus.eu/apiro-configurator

Apiro® rack gear with coupling

Automate cost-effectively



#superlowcost

Format adjustment made easy

Apiro® rack gear with coupling

Synchronise several Apiro® rack gears quickly and easily thanks to the integrated coupling. Particularly suitable for format adjustment.

- ▲ Process reliability thanks to good repeatability
- ▼ Minimisation of set-up costs through automation
- The advantages have already been proven many times in practice, e.g. RL-A14.0109.6 with up to 50N, at up to 500mm/s
- No need for lubricant thanks to the gearbox designed for dry operation



Synchronised format adjustment - a variety of cost-saving solutions

Hours become minutes - minimise set-up times with Apiro®

Introduction / Problem /

Field of application

Every day, billions of containers are transported and processed in expensive and complex packaging machines. A large part of the handling takes place fully automatically and without disruptions. And yet costly machine downtimes due to set-up times are not rare. In times of a growing number of variants and ever shorter production cycles, the flexible adaptation of the machines to new series is becoming increasingly important. In addition to minimising downtimes, the focus is on making production more flexible with high process reliability.

One reason for lengthy set-up times is the large number of adjustment points on long production lines. Many wing screws often have to be adjusted manually. This takes time and often requires the readjustment of individual screws along the line.

igus® GmbH offers solutions for this problem - also for retrofitting on existing machines.

Motorised or manual drive - synchronised rack gears

Are you looking for a solution for changing the format of light products and don't expect any large forces in your system? Then the use of Apiro® rack gears is a cost-effective and flexible option.

In this structure, several rack gears move in parallel and thus laterally adjust the

width of their transport lanes. The rack gears are synchronised via a continuous drive shaft. Thanks to the integrated coupling, it can be connected to the drive shaft in just one movement. Another advantage of this system: the shaft can be driven both by a motor and manually via an Apiro® worm gear.

Robust solution with self-locking

Do you transport heavy products in your system, or do you expect large forces against the railings of your system? These requirements often arise when handling bottles and require a very robust system. The Apiro® modular gearbox system offers several solutions here as well. To implement lateral adjustments, the Apiro® lift/push drive is connected in series. The centric and synchronous adjustment of one or more lanes from above is made possible by synchronising drylin® linear axes with a built-in R/L spindle. Both systems are particularly robust due to their self-locking. In this way, forces arising from potential jamming are absorbed directly on the railing and are not passed on to the drive shaft. The systems are usually driven by motors.

Turn the crank once instead of screwing ten times - the advantages at a glance

Whether manual or motorised drive - thanks to the Apiro® format adjustment,

you save money with every future changeover process. Another important advantage is that due to the position indicators attached to the drive or proximity switches for the motorised drive, you are able to easily document and replicate the perfect lane width setting. Thanks to the infinitely variable adjustment, there is no time for readjustment and the products are guided safely. The self-lubricating Apiro® gearbox promises a fast ROI and can also be easily and quickly integrated into existing systems.

igus.eu/apiro-format-adjustment



Jan Kaiser
Product Manager
drygear® Gear Technology



Apiro® format adjustment drive



Apiro® flexible shaft

RBTX | Automation for companies of all sizes

Low Cost robotics marketplace



RBTX

low cost robotix

igus.eu/news-LCA

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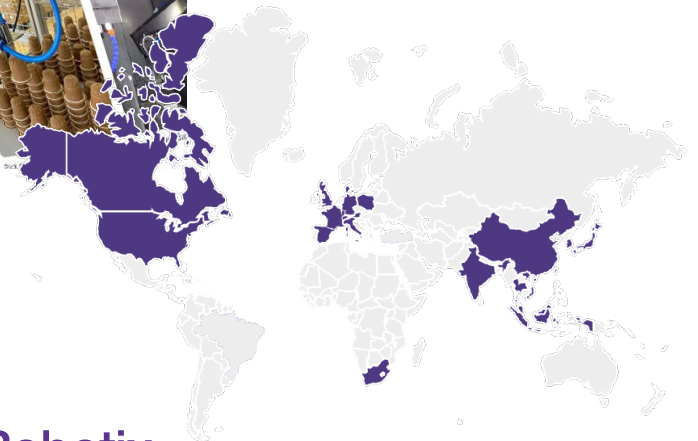
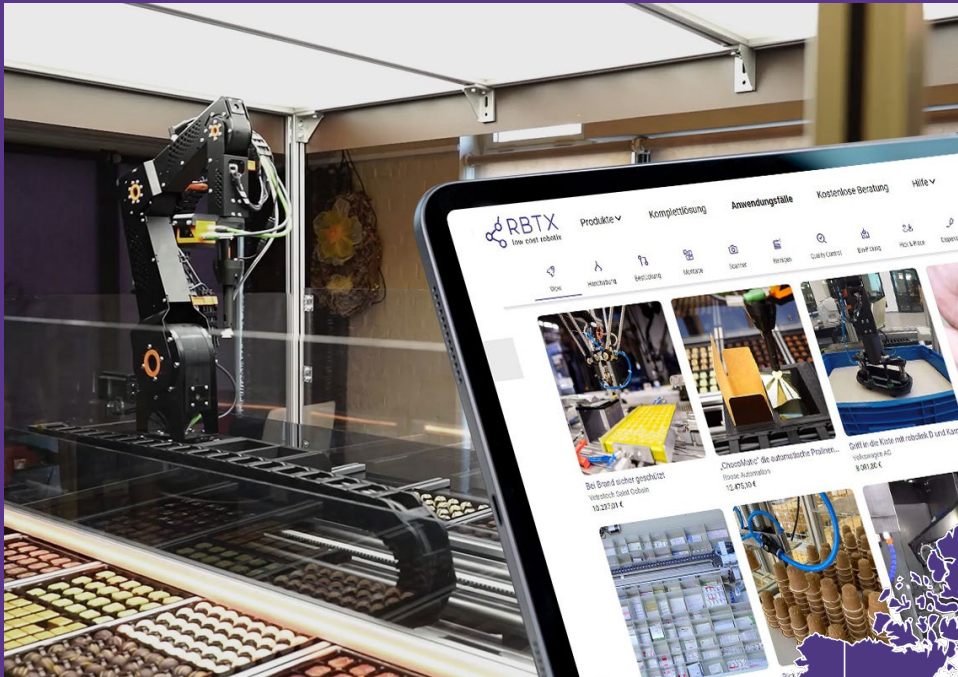
Digital

170 RBTX.com
Low Cost robotics marketplace



RBTX by igus® - the low-cost robotics marketplace

Four years RBTX



The marketplace for Low Cost Robotix

RBTX by igus® - low-cost components and solutions

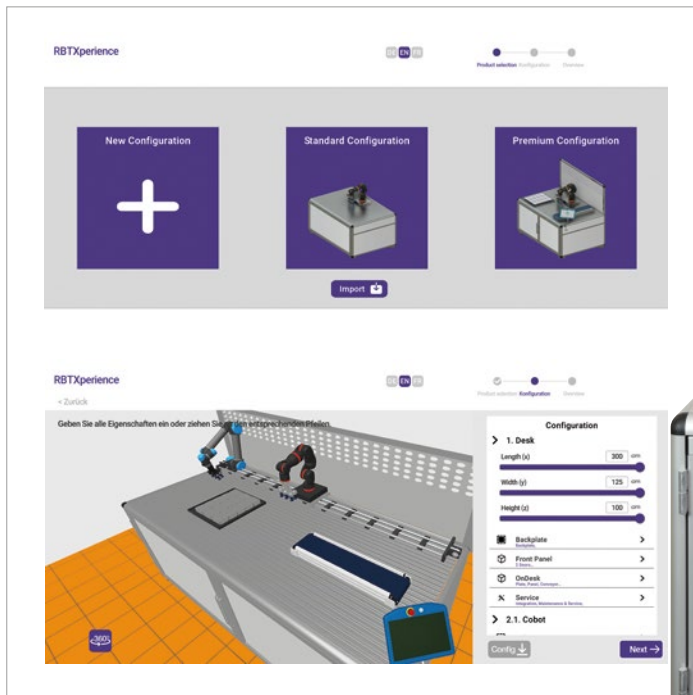
The RBTX marketplace brings together users and over 100 suppliers of low-cost Robotix components. More than 350 low-cost solutions serve as inspiration, with 98% of them under EUR 12,000. All low-cost solutions have a quick ROI of 3-12 months.

- ▲ Growing low-cost product portfolio
- ▼ Cost down: Focus on the low-cost price segment, over 350 application examples with 98% of them under EUR 12,000
- Over 2,000 consulting projects and free feasibility studies in 15 customer testing areas in Germany and 22 worldwide
- Durable industrial products from leading manufacturers, more than 100 partners
- Easily assemble a complete robotic solution with the MyRobot configurator on [RBTX.com](https://www.rbtix.com)



Individual Low Cost solutions for your application

The RBTXperience



- 1 Configure
- 2 Order
- 3 Assemble



New

Low Cost solution in a few clicks

Individual Low Cost solutions for your application

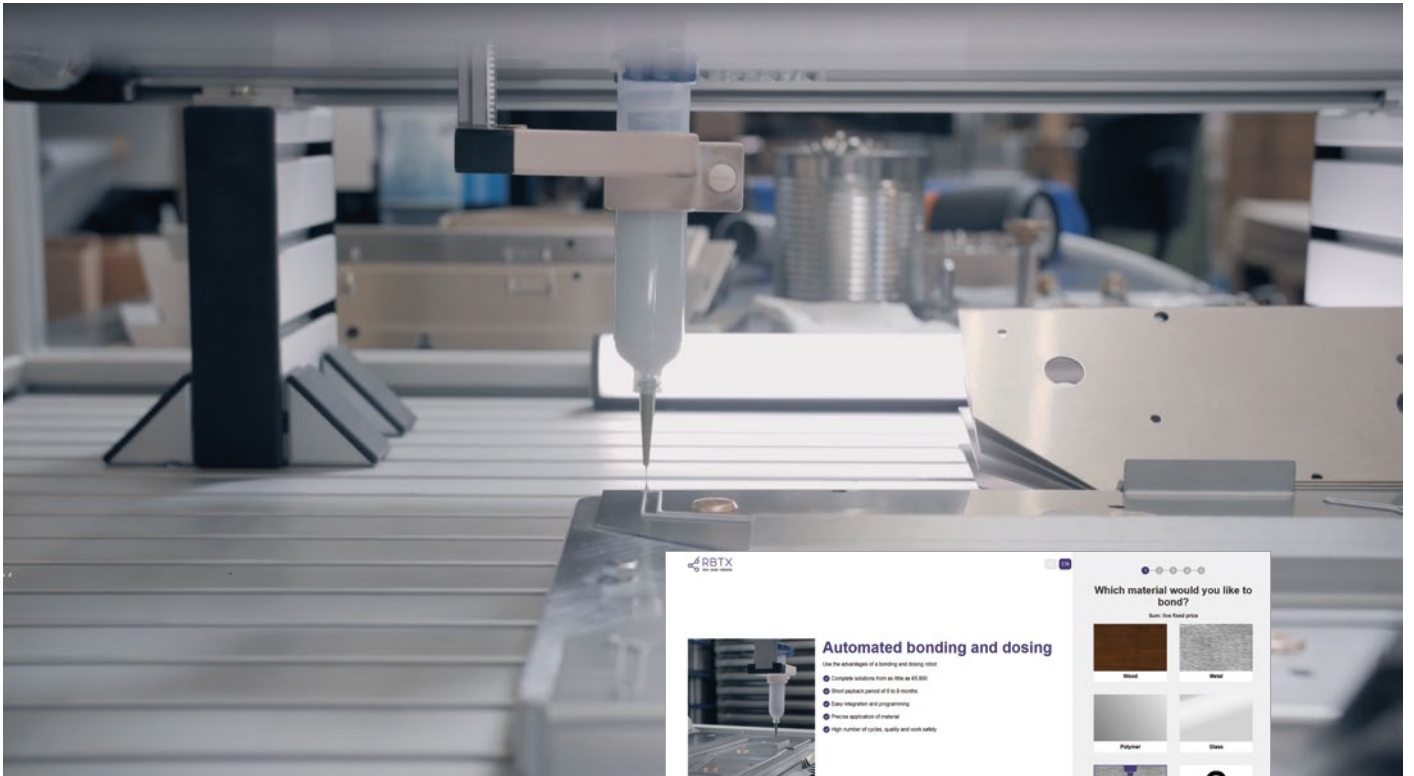
On [RBTX.com](https://www.rbt.com), our low-cost robotix marketplace, you can click together your own Low Cost solution with our new configurator. Consisting of: various robots, conveyor belts, grippers, enclosures and much more.

- ▲ Components and dimensions tailored to your needs.
- ▼ Save time with customised kits or by using a design from the community
- Tested for compatibility
- Can be expanded at will
- 🎯 Simple configurator



Bonding and dosing configurator

To the gluing solution in 5 clicks



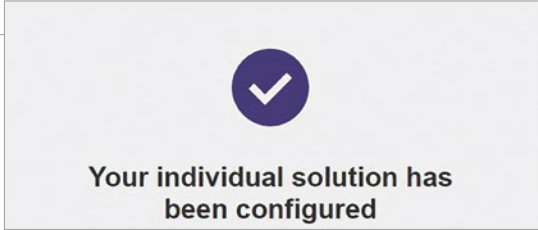
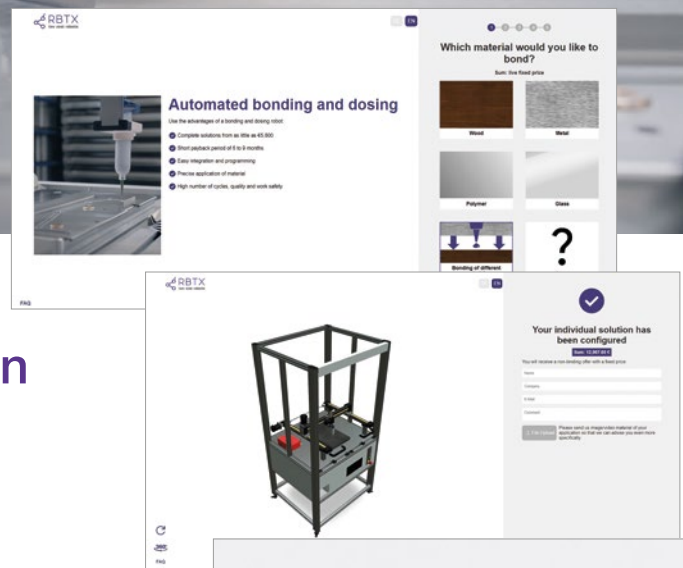
New

Configure automation solution online

Bonding and dosing configurator

Automate your gluing application in just a few steps:
configurator.rbt.com/gluing

- ▲ Easily automate gluing and dosing processes
- ▼ Save individual design effort
- Compatibility of all built-in components guaranteed
- Minimum use of resources through standardised systems
- Put together a robot application with five clicks and receive an immediate offer



A gluing robot for only 8,000 euros

The dream flat has been found. But before moving in, one has to renovate. Apply paste to the wallpaper metre by metre, smearing hands and clothes. tapo-fix GmbH & Co. KG doesn't like it either. The company from Wolfsburg has therefore developed a wallpapering device for this unpleasant job. It can be attached to the end of the trestle table, some models stand on their own base. If the user now clamps the end of the wallpaper into the roller system, he can pull the wallpaper over a roller through a stainless steel tub filled with paste. The adhesive is already applied evenly. A solution that is particularly popular with craftsmen. For 60 years, the small family business with 25 employees has been manufacturing around 150 devices in different series every week.

Some work steps in the production of tapo-fix are already automated with CNC machines, and others are done manually. For example, the spot welding of the side parts of the stainless steel tub. An employee has to balance the tub in the air for several minutes in order to place the spot welds precisely. Up to 400 times a week. This is not only strenuous and time-consuming due to the rework such as removing the tempering colours, but also only masters the task after a lot of experience. All the more problematic when the employee is ill. It is difficult to find a replacement for his expertise. There is a risk of lost productivity. "We therefore decided to replace spot welding with gluing. And to automate the process at the same time in order to further support employees," explains Moritz Hohenhövel, CEO of tapo-fix.

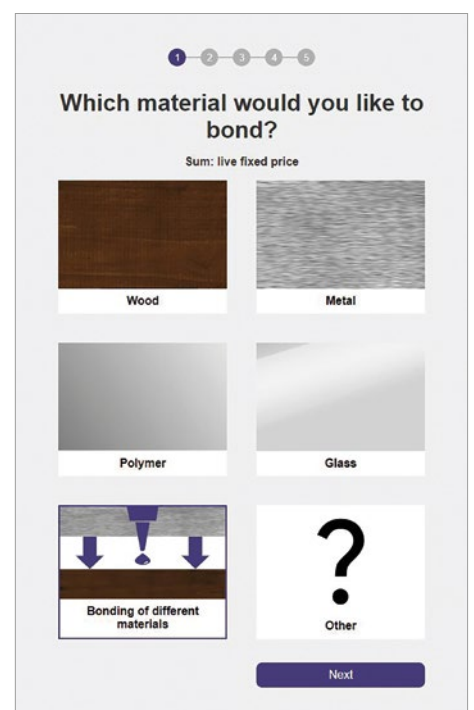
Fast and secure: tapo-fix configures automation solutions online

Hohenhövel and his father, former CEO of the family business, engineer and designer, configure their gluing robot online on the RBTX platform. The centrepiece: a linear robot that moves

over three linear axes, driven by toothed belts and NEMA stepper motors. Mounted on the carriage: a cartridge that dispenses adhesive via a fine nozzle. The automation novices were able to determine the exact dimensions of the system with just a few clicks on the computer and thus adapt the linear robot to the size of the component to be bonded like a tailor-made suit. "When it came to automation, we used to be put off by the fact that we had to laboriously collect and coordinate components such as linear axes, stepper motors, cables, energy supply systems and control systems," Hohenhövel recalls. "We were all the happier that at RBTX all the ingredients for an individual automation solution are already coordinated and tested." Another decision-making aid: an online tool that uses a digital twin to visualise the movement options of the configured room linear robot. "After we had configured the linear robot online and convinced ourselves of the functionality, we could order with a clear conscience." The hardware components were installed. Hardly more complicated is the programming of the movement sequence. With the igus® Robot Control software, Hohenhövel was able to define the adhesive path without any programming knowledge. Even the positions where the nozzle of the adhesive cartridge opens and closes. The system was ready for use after three days. This marked the end of spot welding. Instead, employees now place the side parts of the stainless steel tub on a platform under the room linear robot. A push of a button later, the robot starts moving. And draws the adhesive path that corresponds to the side contours of the stainless steel tub. More precise than anyone, with a repeatability of 0.02 millimetres. For comparison: human hair is between 0.05 and 0.08 millimetres thick. After gluing, the employee only has to press the side part against the tub.

Cost savings of around 8,000 euros per year

The gluing robot has now been in operation at tapo-fix for a few months. An investment that has paid off. "Not only have we supported our employees, we have also achieved cost savings of around 8,000 euros per year," says Hohenhövel happily. The system hardly costs more. The linear robot around 8,000 euros, the control system just under 380 euros. For comparison: many PLC control systems are oversized for simple automation tasks and quickly incur costs of over 10,000 euros including the licence. The project proves once again that, thanks to low-cost robotics, it is now possible to automate monotonous processes cost-effectively and with little risk.



configurator.rbtx.com/gluing



Free online consultation for your application

RBTXpert

Our RBTXperts are automation experts who will help you to automate your application including the selection of components. At a fixed price.

- ▲ Easily automate your manual processes
- ▼ Free consultation from our RBTXperts
- Over 2,000 consulting projects
- Automation with little effort
- 🎧 Select your desired date online and find a solution via video call



New #superlowcost

Inexpensive component separator

RBTX VarioShaker 270 lite

The shaker is suitable for pick and place and flexible feeding applications. It was created through collaboration with our partner Variobotic.

- ▲ Robust construction and easy to use
- ▼ Optimised for low cost applications
- Thanks to our partner Variobotic, many years of experience have gone into the product
- Durable product design
- 🎧 Easily assemble a complete robotic solution with the MyRobot configurator on [RBTX.com](https://www.rbt.com)



New #superlowcost

Inexpensive spiral conveyors

RBTX spiral conveyors

Inexpensive and easy commissioning. Ideal for industrial areas. Thanks to 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: send us your components
- A lot of experience of our partners is in the product
- Durable and versatile product
- 🔗 Easily assemble a complete robotic solution with the MyRobot configurator on [RBTX.com](https://www.rbt.com)



New

Safety category

Safety components from leading manufacturers

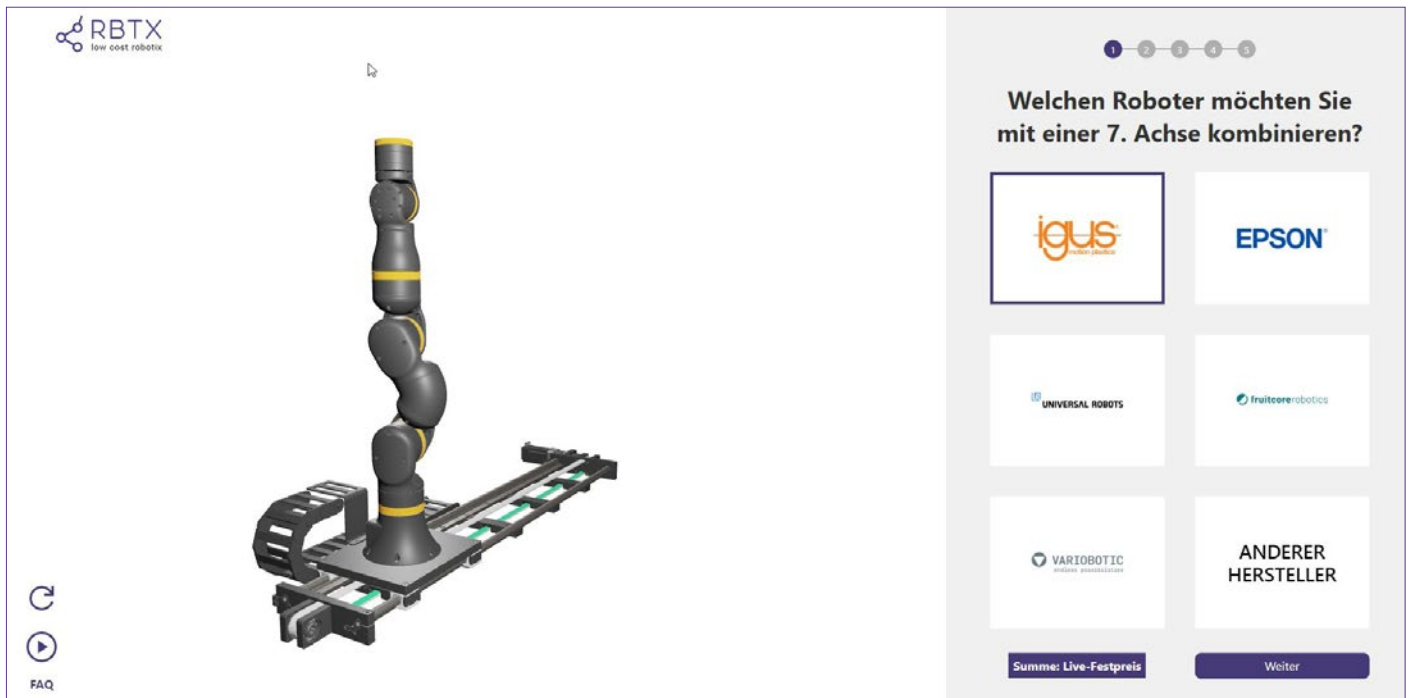
In the new safety category you will find safety components from our partners.

- ▲ Components from leading manufacturers
- ▼ Best price-performance ratio
- Many years of product experience from our partners
- Durable products
- 🔗 Easily assemble a complete robotic solution with the MyRobot configurator on [RBTX.com](https://www.rbt.com)



7th axis configurator for different manufacturers

Enlarge robot workspace



New

One linear axis for all robots

7th axis configurator for different manufacturers

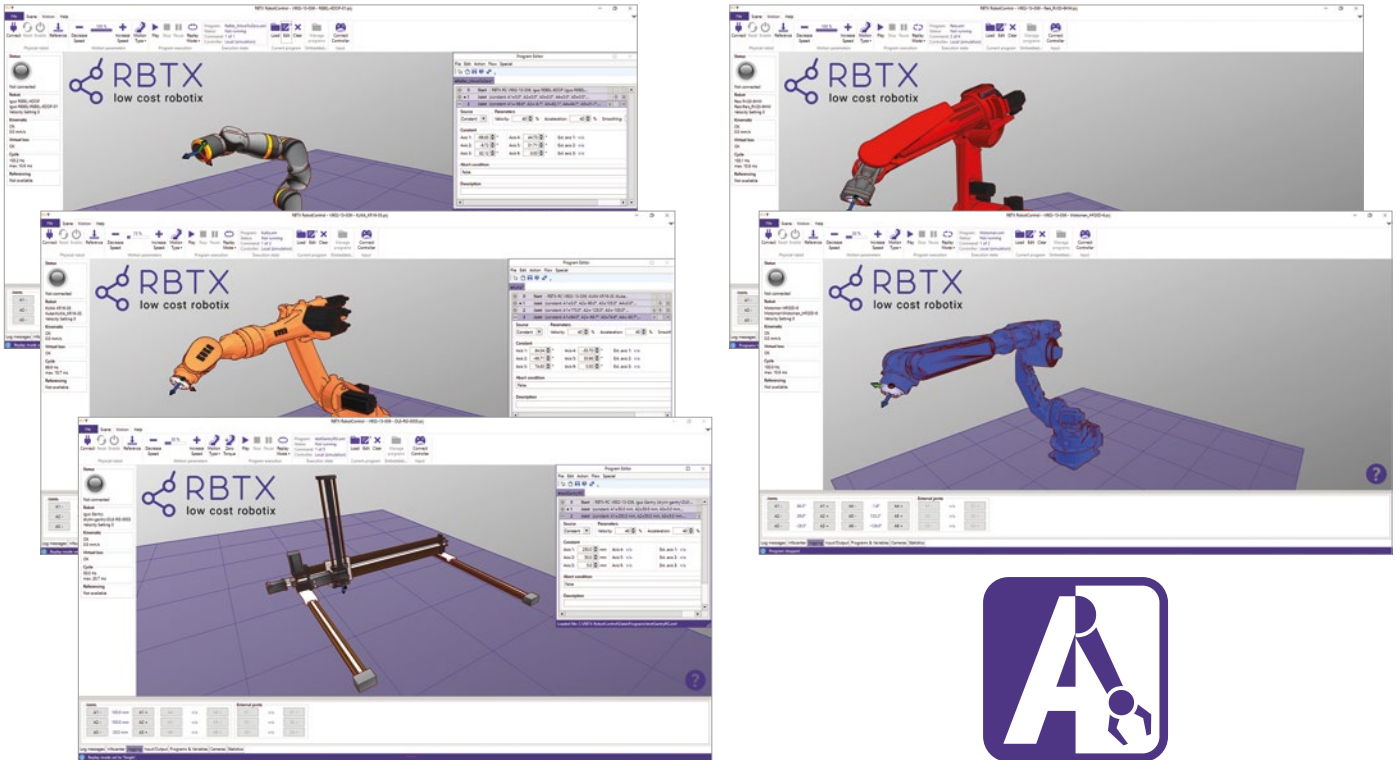
Combine robots from the most varied manufacturers with a 7th axis in the configurator with just a few clicks.

configurator.rbt.com/7thaxis

- ▲ Configure a robot workspace that is up to four times larger with just a few clicks
- ▼ Save enquiring time and effort through direct, non-binding offer and application examples
- Compatibility of all robots and 7th axis combination checked
- Expand the automation system instead of developing it from scratch
- 🎯 Conveniently try out a wide variety of robot-linear combinations with a live fixed price from anywhere



Program in five minutes



AnyApp

New

Time is money - control different robots with one software

AnyApp

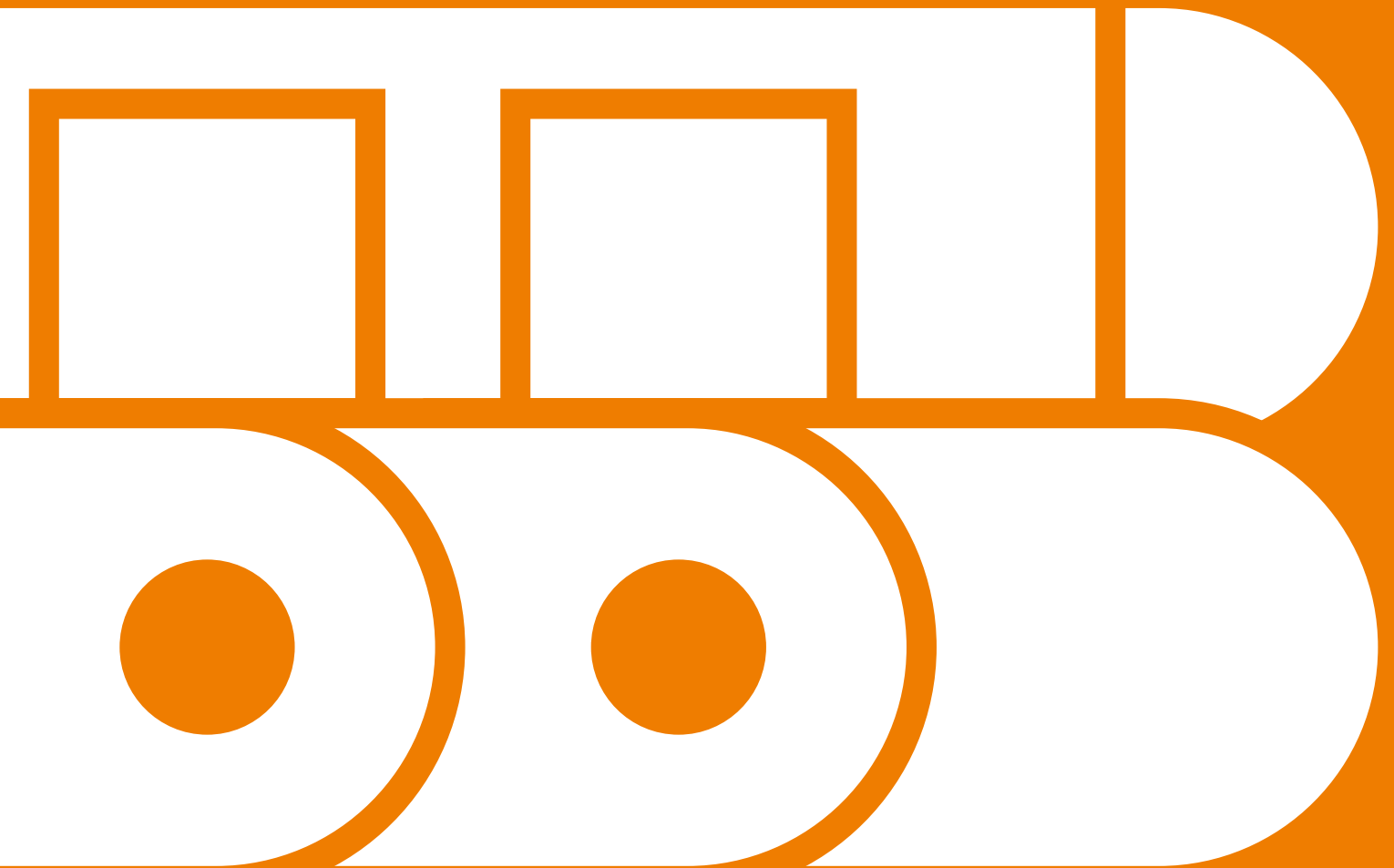
With the AnyApp, robots from a wide variety of manufacturers can be programmed with a universal software.

- ▲ Program robots from different manufacturers with just one app
- ▼ Save integration effort and costs
- Tested on five different manufacturers
- Counteracts a fragmented software landscape
- 🎯 Reduced programming effort because users only have to learn one software program



Moving energy made easy

e-chain systems[®] and accessories



igus.eu/news-ecs

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E4Q.64L e-chain system®

Strong, light and cost-effective



E4QL

LARGE
LIGHTWEIGHT
LEAN DESIGN
LONG SERVICE LIFE
LOWCOST
LIGHTNING FAST OPENING

New

The best combination of strength and lightweight ... highly dynamic, can be opened by hand

E4Q.64L e-chain system®

Based on the successful E4Q, there is now the first size of an L variant with an inner height of 64mm. 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 31% stronger than the previous 14240 series
- ▼ Depending on the width, around 15-20% less cost than the E4Q.58 thanks to slimmer side links
- E4Q.64L breaking moment is 31% higher than that of the 14240 series (see graph)
- 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



The special design of the new E4Q.L

Developed on the basis of the successful E4Q series, the new L variant comes with many proven advantages as standard

The bio-mechanic design increases strength and extends service life while reducing weight. The quick-opening crossbars allow the chain to be opened/closed easily and intuitively.

Another advantage of the growing E4Q modular system is that no new crossbars need to be developed for the new E4Q.64L series because the E4Q.58's



have been used. The complete range of 29 widths, from 100 to 500mm, is thus immediately available.

E4Q is successful - so why the L version?

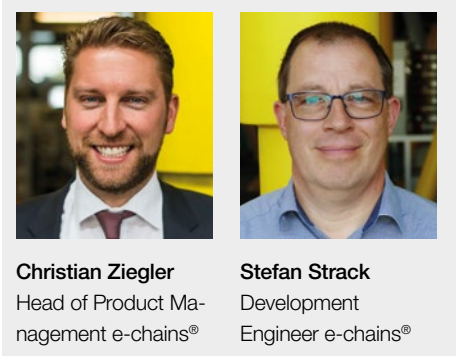
Many applications do not need the E4Q's thickness at all. e-chains® with a smaller wall thickness are sufficient to guide the cable packages. This is especially true of unsupported energy supply systems with low or medium loads, such as those in machine tools, woodworking equipment, and car washes. igus® has developed the L version to offer users the advantages of the E4Q in these applications as well, and at an attractive price. Depending on the width, the E4Q.64L costs about 15-20% less than the E4Q.58, but is about 30% stronger than the previous models (the "E4 light" and "E4.1 LEAN").

"Thanks to the outstanding strength of the E4QL, we can serve many applications more cost-effectively than ever before while offering the proven E4Q advantages," says Christian Ziegler, Head of e-chain® Product Management.

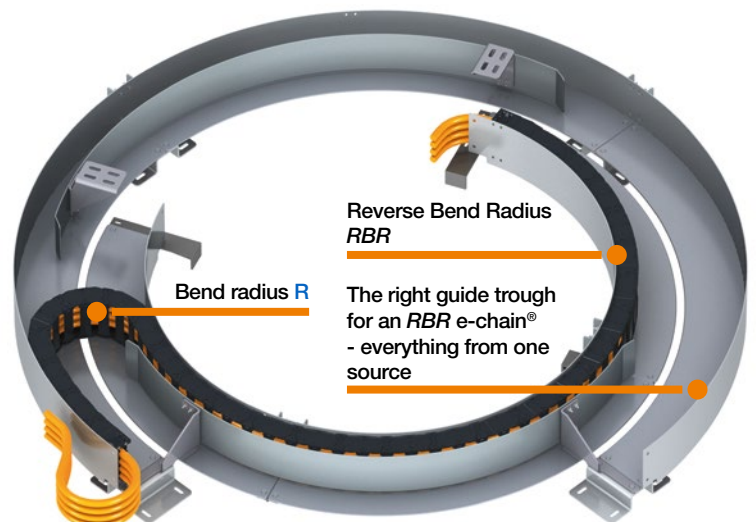
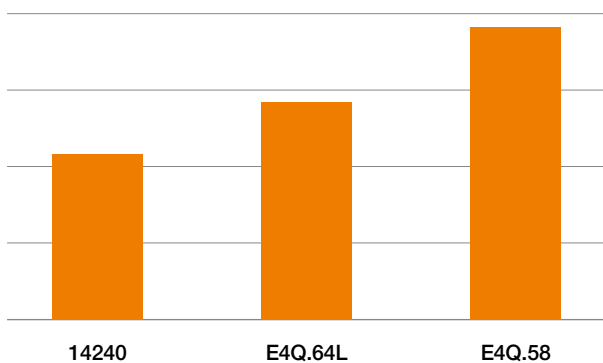
New stop-dog system

"We have completely rethought the stop-dog system. Development goals were more strength and service life than the predecessors with two stop-dogs while retaining the option of a Reverse Bend Radius (RBR)," says development engineer Stefan Strack. Reverse Bend Radius means that the e-chain® can

bend in two directions. The result of this development process is the first igus® e-chain® with three stop-dogs. To the proven inner/outer link principle has been added a clever, innovative Reverse Bend Radius option: the inner link continues to determine the chain's bend radius via the size of the stop-dog pocket. For the first time, the outer link is used to implement the Reverse Bend Radius. Reducing the size of the stop-dog allows the chain to be bent backwards at predefined angles. As a stock standard, the Reverse Bend Radius will initially be available in 135, 200, and 500mm sizes. These RBRs can be combined with all standard radii – for flexible solutions to circular movements, for example.

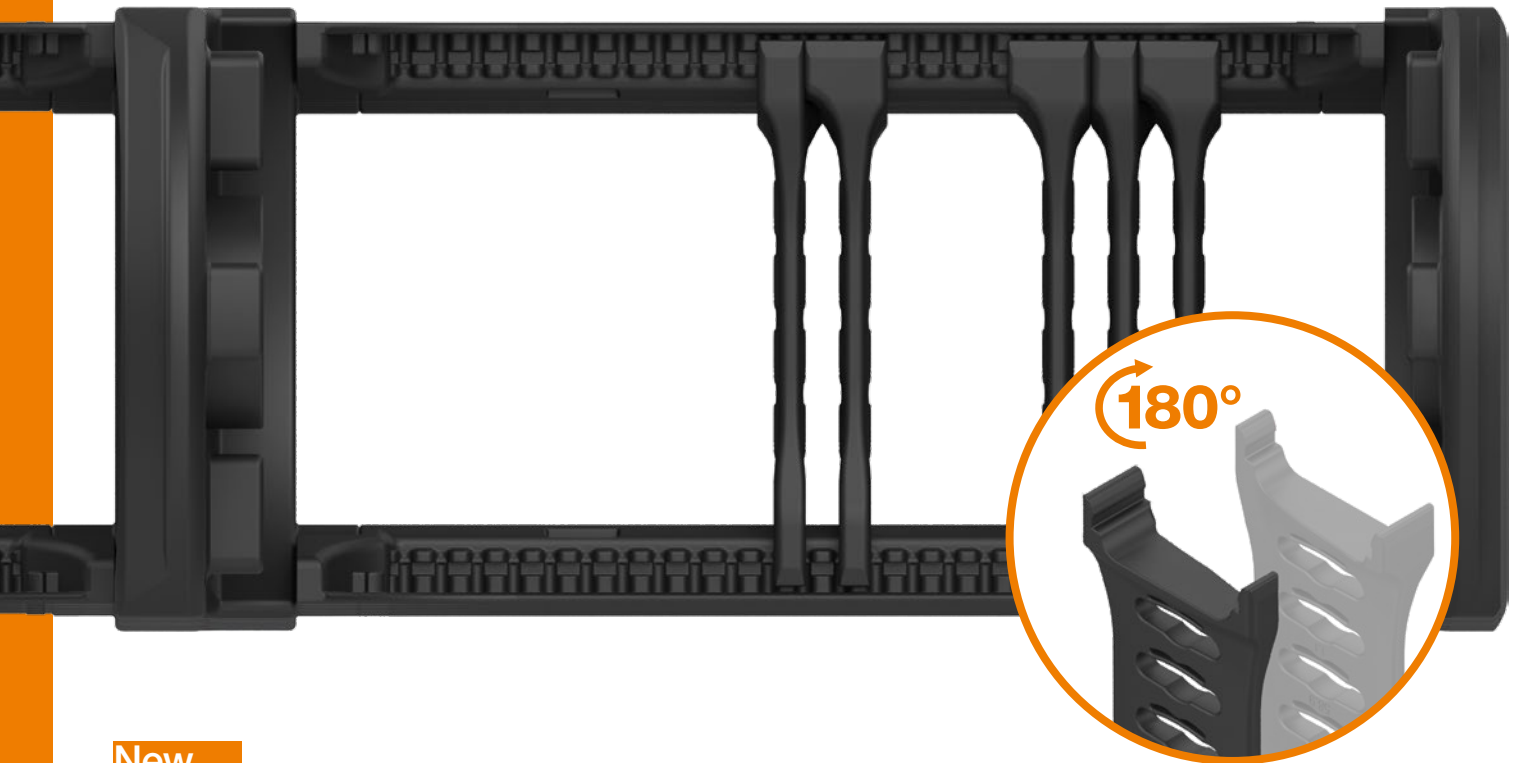


Moment of breakage



New accessories

Expanding the E4Q modular kit



New

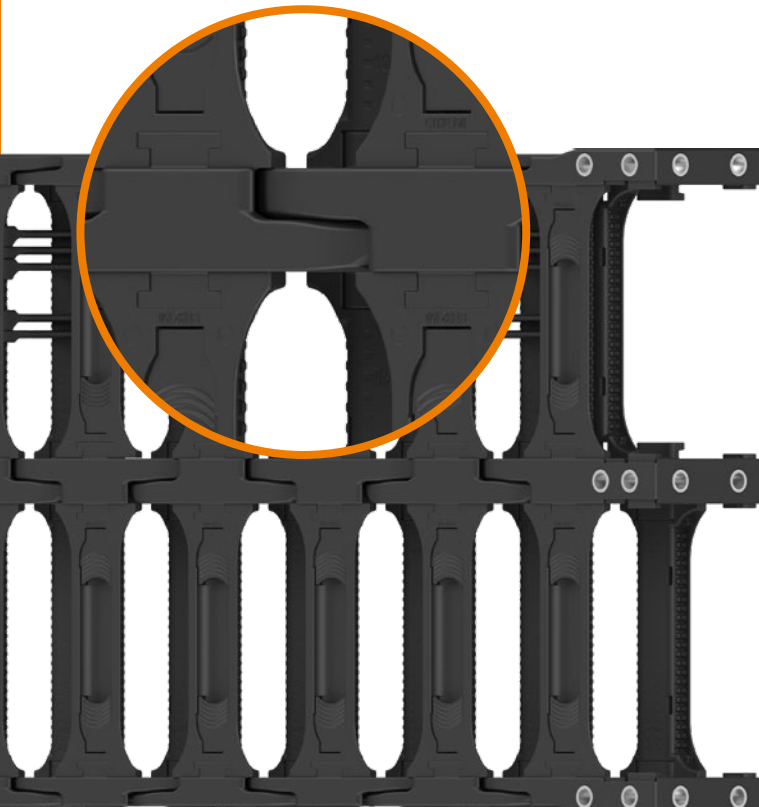
Guide many small cables easily

Hi.9 separators for the E4Q.58

The new, asymmetrical Hi.9 separator (58.9 for the E4Q.58, for example), can now be used for simple guidance of many thin cables in E4Q energy chains. Narrow chambers can be easily formed by offsetting insertion by 180°. The e-chain® is also very easy to open on one side, even when many separators are installed.

- ▲ Expanded variability for many small cables
- ▼ The e-chain® interior is optimally used
- Combining the advantages of the tried-and-tested separators Hi.3 (guide thin cables) and Hi.2 (simple opening with a secure stability) that are in use in millions of applications
- Effective interior use reduces material consumption
- 🔗 Online tools for digital configuration and individual service life calculation





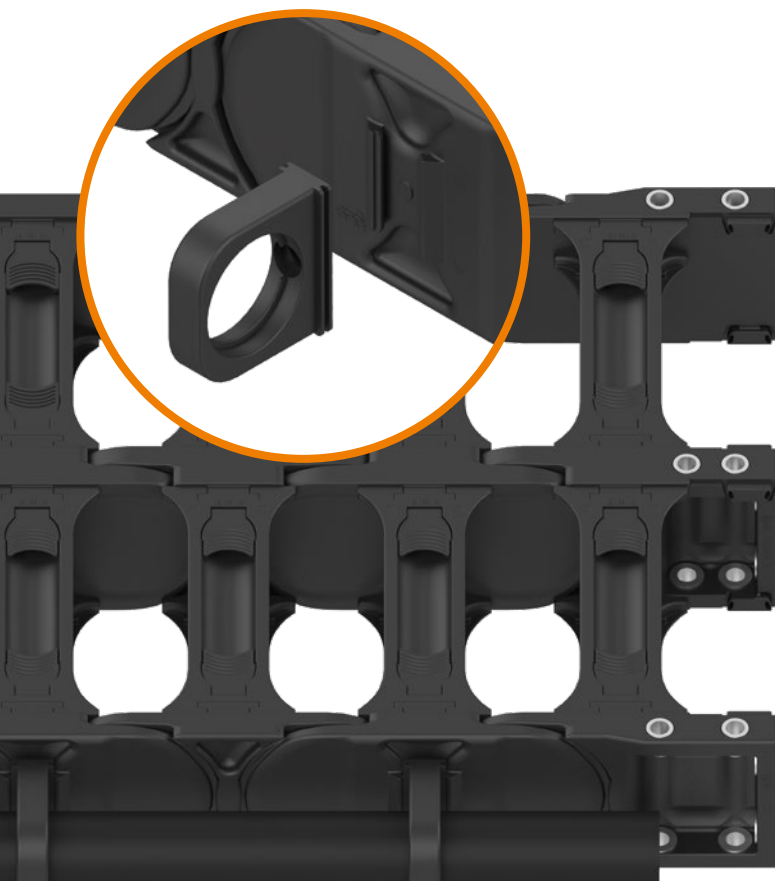
Study

Easy e-chain® extension

Extension link for the E4Q.58

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.

- ▲ Just 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.
- Have your energy chain recycled at the end of its life cycle with the igus® Chainge recycling program. Irrespective of the manufacturer: igus.eu/chainge



Study

Simple guidance parallel to the chain

TUB link for the E4Q.58

Guide additional cables, hoses, or corrugated tubes parallel to the existing e-chain®. Retrofitting is easy – just install PMA CLIP supports. Sizes from 17-48mm.

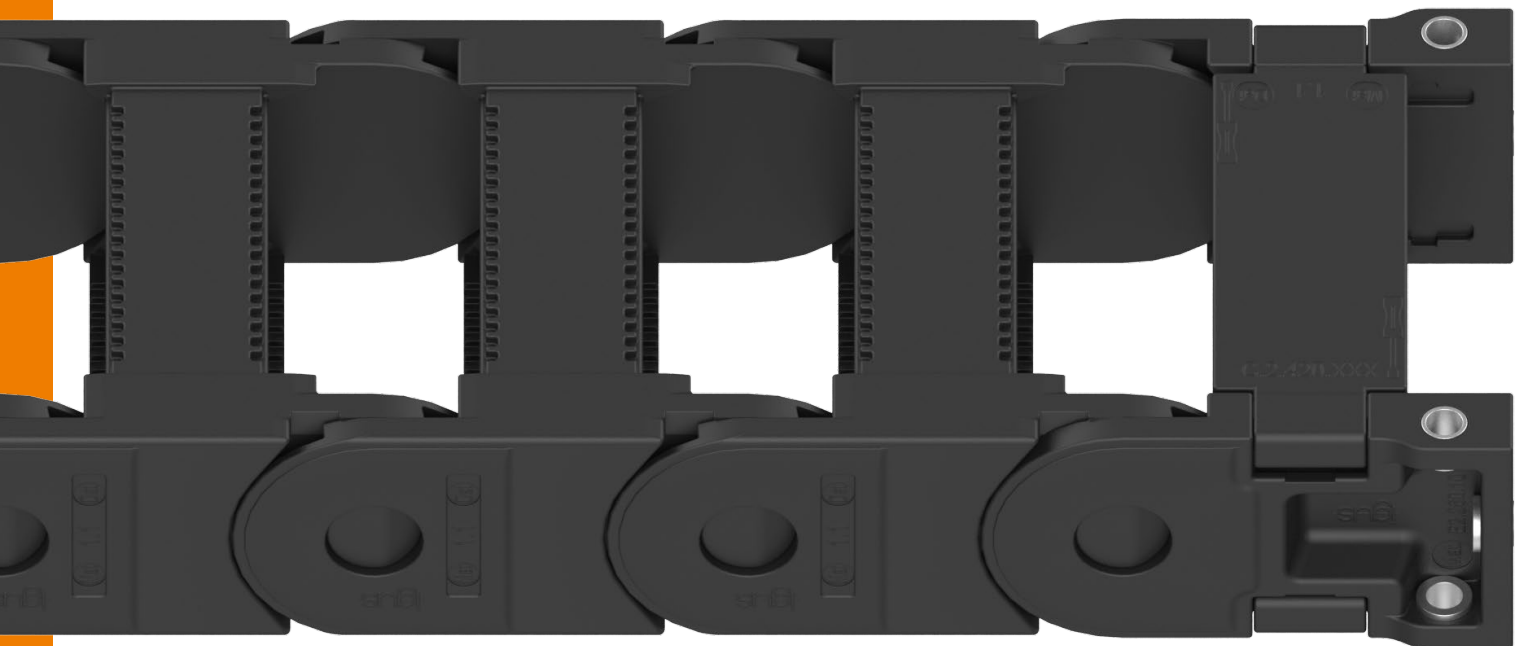
- ▲ For laterally guided cables and hoses
- ▼ Quick replacement
- TUB product range for E4.1 and E4.1L systems successfully used in numerous applications
- Have your energy chain recycled at the end of its life cycle with the igus® Chainge recycling program. Irrespective of the manufacturer: igus.eu/chainge



E2C.26 e-chain® with one-piece design

Guide hydraulics cost-effectively

Recycling made easy –
Change
by igus®



New

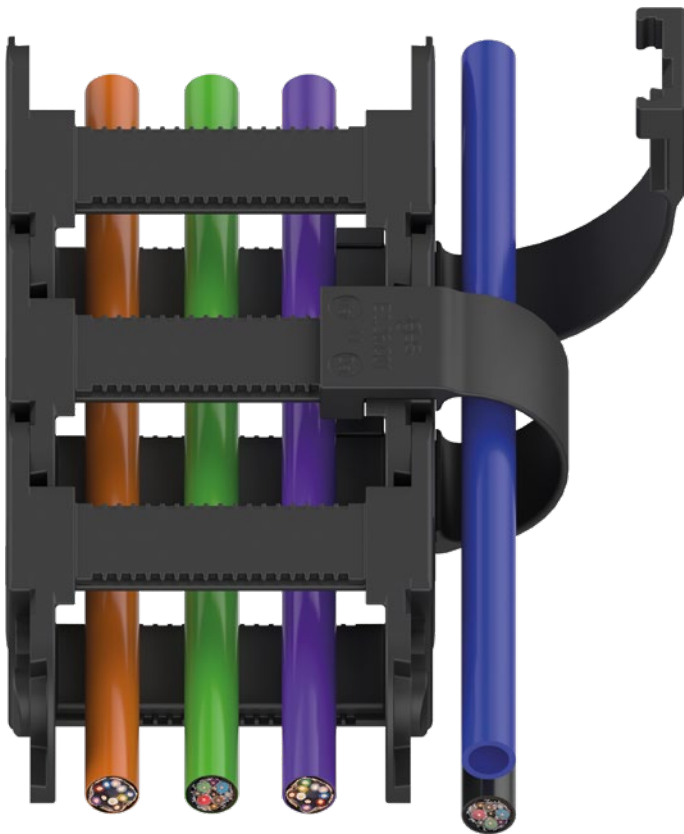
Cost up to 33% less with 20% more additional load

E2C.26 e-chain® with one-piece design

Addition to the successful E2.1 product range. Closed (non-openable) designs with an inner height of 26mm. Cost-effective with increased additional load, making it ideal for guiding hydraulics. Available in 4 width (25, 38, 57 and 77mm).

- ▲ One-piece, non-openable, integrated brake
- ▼ Costs less than the E2.1 series (by up to 33%)
- 20% more additional load and 25% more unsupported length than the E2/000 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
- 🔗 Online tools for digital configuration and individual service life calculation





New

Easy guidance outside the chain

E2.26.C01 snapclip for the E2.26 series

Small part, big effect: This accessory can be used to easily expand the fillable space in an existing chain configuration by up to 375mm², making it easier to subsequently guide cables and hoses outside of the e-chain®.

- ▲ Quick, easy filling
- ▼ Simple retrofit to the existing e-chain®
- Up to 375mm² more fillable space in the e-chain®
- Have your energy chain recycled at the end of its life cycle with the igus® Chainge recycling program. Irrespective of the manufacturer: igus.eu/chainge
- 🔗 Online tools for digital configuration and individual service life calculation



New

Reduction of assembly time by 94%

E2.1 HD chain opener

The new chain openers can be used to open E2.1 energy chains metre by metre in a few seconds to insert separators and shelves. Safe guidance with greatly reduced effort and time and minimised risk of crossbar damage.

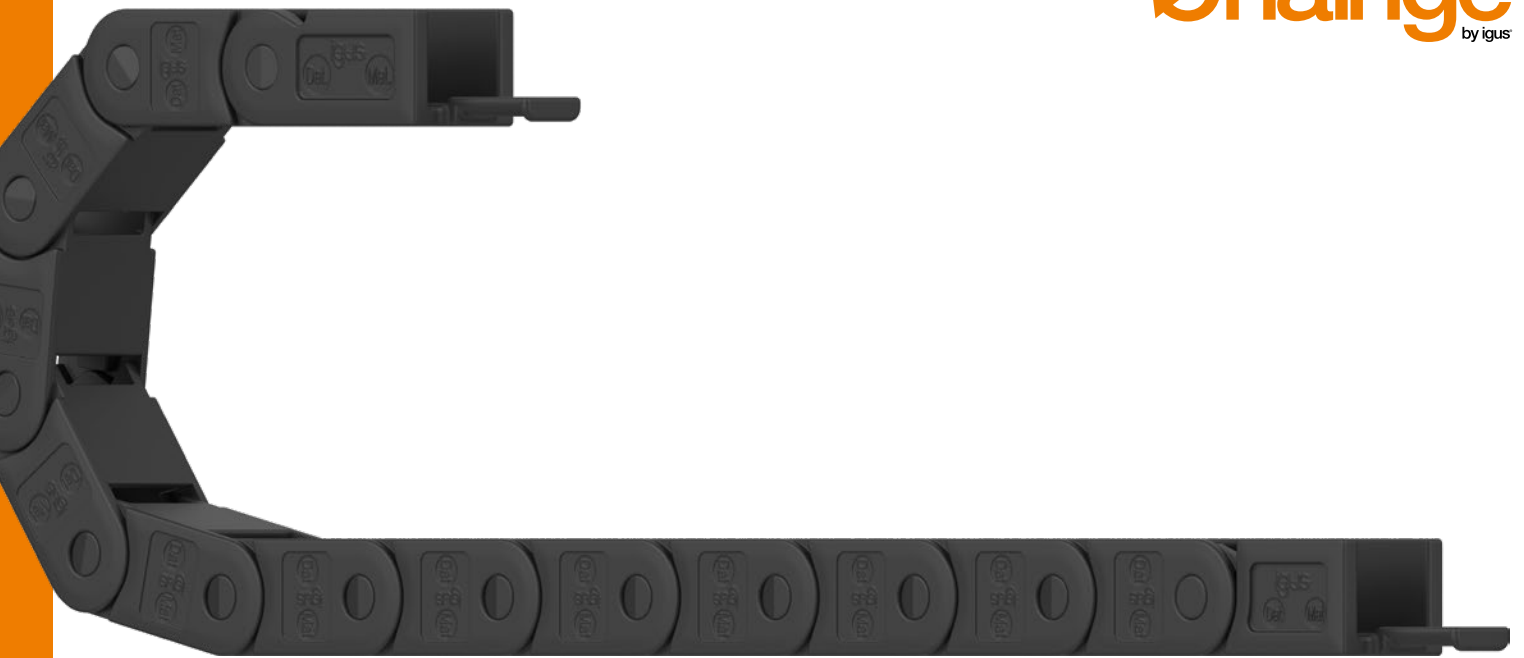
- ▲ Opening of longer e-chain® sections in one go
- ▼ Reduced e-chain® opening time, from 33 to 2 seconds (one-metre section)
- Assembly requires 94% less time than with a screwdriver
- Simple repair/replacement of individual parts instead of complete opener replacement



E2C.10L e-chain® made of recycled material

Standard sustainability

Recycling made easy –
Change
by igus®



New #recycling

Inner width up, outer width down

E2C.10L e-chain® made of recycled material

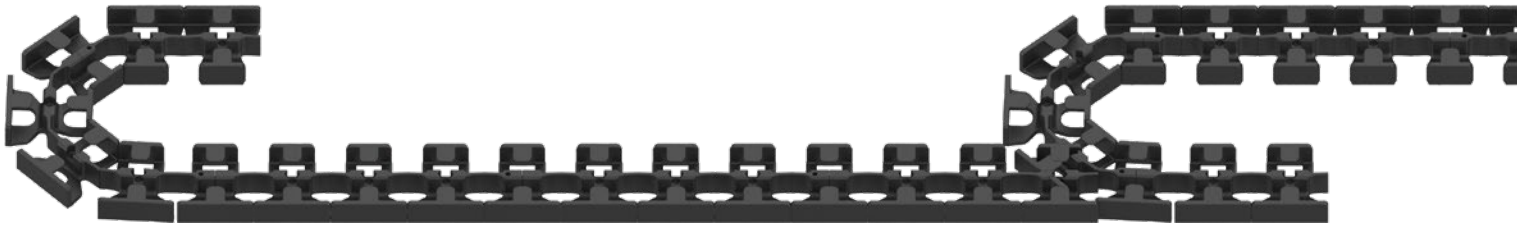
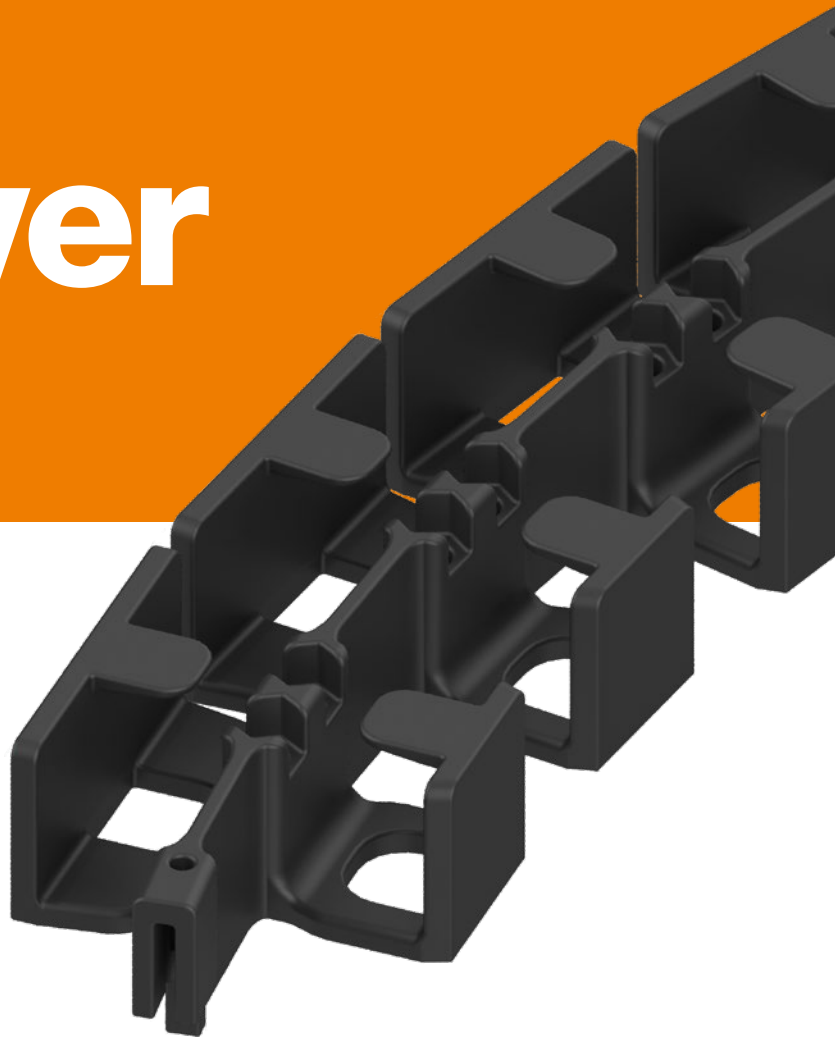
The new E2.1 design of the E2C.10L offers more interior space with a reduced exterior width. The standard chain is produced from igumid® CG recycled material and is initially available with inner widths of 6 and 10mm. More widths available upon request.

- ▲ More inner width with less outer width than with the E2.10 series
- ▼ Cable-friendly design
- 20% more additional load and 25% more unsupported length than the E2 micro series
- Made from igumid® CG recycling material as standard, more about the igus® Change recycling program: igus.eu/change
- 🔗 Online tools for digital configuration and individual service life calculation



draw-e-chain

For server racks ...



New #smallspace #superlowcost

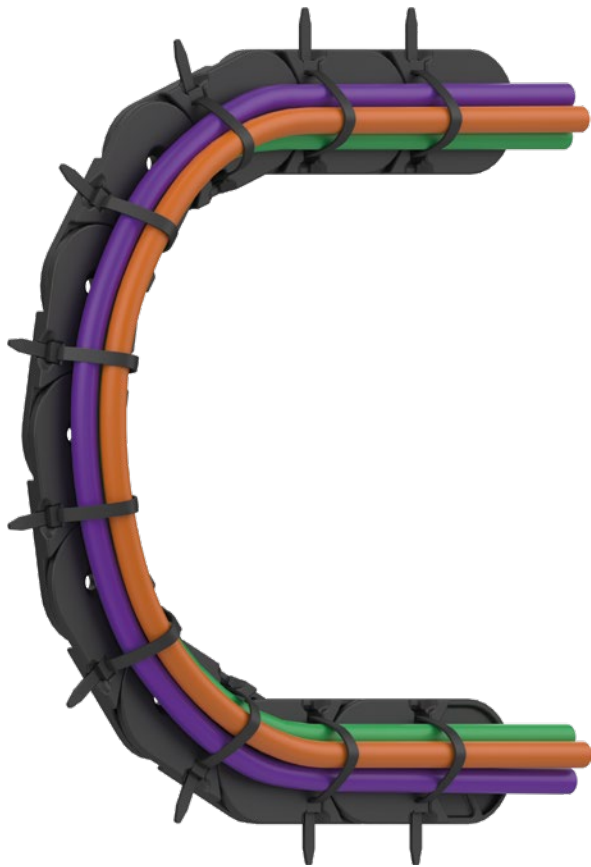
Cable guidance in very tight spaces

draw-e-chain

Special, flat, simple, inexpensive design for cable guidance in pull-outs or drawers of any kind. Optimised for lateral installation with a radius curve in the horizontal level.

- ▲ Inexpensive cable guidance with easy filling and defined bend radius
- ▼ Fewer parts thanks to the band design and no additional mounting brackets
- 13% slimmer than the previously slimmest standard e-chain® B17.1.048.0 (side-mounted installation) and can be filled from above
- Cable guidance that is designed exactly for what is needed saves material





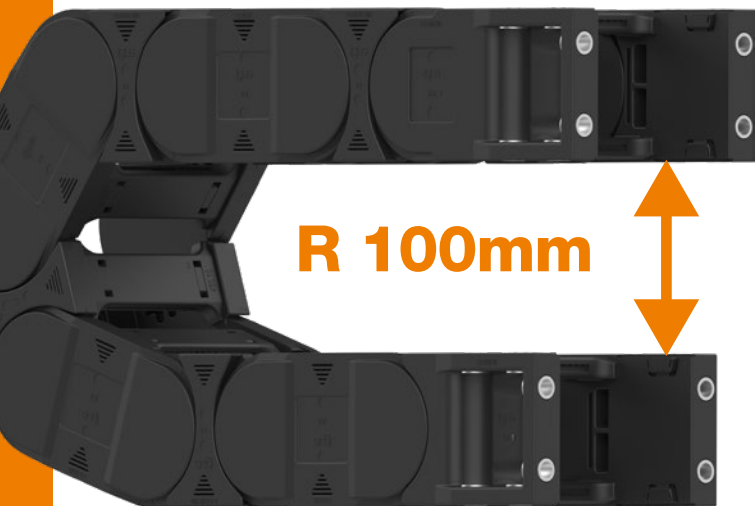
New #lowcost

Guide cables simply, reliably, and cost-effectively

snapchain 2.0

The simplest ideas are often the best: The new snapchain 2.0 allows cable packages to be easily fixed with standard cable ties and safely guided within the bend radius. Flexible, versatile use.

- ▲ Assemble cable packages into a bundle quickly and with few parts and guide them safely
- ▼ Flexibility thanks to various lengths of commercially available cable ties
- Tried-and-tested snapchain design used successfully in many high volume applications for more than 20 years
- Made from igumid® CG recycling material as standard, more about the igus® Change recycling program: igus.eu/change



New

Large chain, small installation space

E4.56 e-chain® with new 100mm bend radius

With the new bend radius of 100mm, the E4.56 energy chain series can now be used in even smaller installation spaces. Large modular system with many available widths and accessories.

- ▲ e-chain® with large inner height and small radius
- ▼ Guide more cables in small radii
- High strength (crossbars with double lock) and straight run (inner/outer link principle)
- Have your energy chain recycled at the end of its life cycle with the igus® Change recycling program. Irrespective of the manufacturer: igus.eu/change
- 🔗 Online tools for digital configuration and individual service life calculation



Simple calculation

Service life
Part number: E2.26.103.200.0

Parameters
Installation type: Unsupported
Inner height: 26 mm
Inner width: 103 mm
Outer height: 35 mm
Outer width: 120 mm
Bend radius: 200 mm

Service life
16,685,000
Double strokes (guaranteed)
amounts to a total distance of
100,110 km (guaranteed)

51.48 EUR/m

Request guarantee
Save information
View product details

Alternative chains

Part number	Inner height [mm]	Inner width [mm]	Outer height [mm]	Outer width [mm]	Bend radius [mm]	Price [EUR/m]	Service life [Double strokes] ↓
R4.28.100.200.0	28	100	42	120	200	83.16	34,441,000
E4.28.100.200.0	28	100	42	120	200	59.84	34,436,000
E4.31L.100.200.0	31	100	42	114	200	50.38	29,982,000
E4.31L.112.200.0	31	112	42	126.5	200	50.82	29,704,000
R4.31L.100.200.0	31	100	42	114	200	78.32	27,529,000
E2.26.103.225.0	26	103	35	120	225	51.48	16,928,000
E2i.26.103.225.0	26	103	35	120	225	51.48	16,702,000
E2i.26.103.200.0	26	103	35	120	200	51.48	16,685,000
2400.10.225.0	25	103	35	119	225	51.48	11,301,000

New

36-month guarantee of the calculated service life*

e-chain® service life calculator

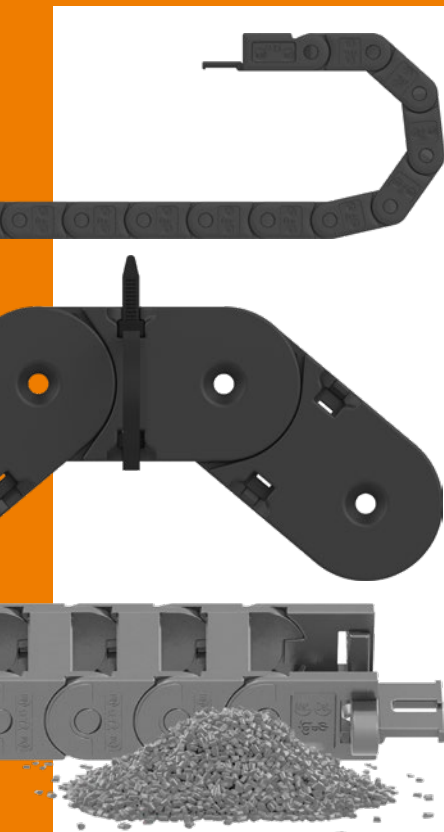
Our service life calculator gives you the energy chain's expected service life when you enter a few application parameters. You can also use the tool to create a guarantee certificate for up to 36 months (*The guarantee applies to the calculated service life, and not longer than 36 months).

- ▲ Intuitive, modern design and integration of other e-chains® series (including rol e-chains® for the first time)
- ▼ No over-engineering: more cost-effective alternatives for the same application parameters displayed (with a shorter service life)
- Every year, about 4,000 e-chain® tests are conducted in the igus® test laboratory (about 10 billion e-chain® cycles); more than 9,200 e-chain systems® have already been installed in crane systems worldwide
- Reduced resource consumption: the smallest (lightest) possible e-chain® selected for each requirement



igus® Chainge programme for all technical plastics

Recycling made easy



New #recycling

The range of products made from the igumid® CG material is growing

igus® Chainge programme for all technical plastics

The range of products made from CG material continues to grow. New parts are constantly being tested in the laboratory and their suitability checked so that we can give customers the service life calculation and reliability they have come to expect from us. That is igus® quality.

- ▲ More than 100 products made from CG material are available from stock, with more in development
- ▼ Receive a voucher for chainge returns and save money on your next order
- In the igus® laboratory, we test each part before we replace the standard material with igumid CG
- Products made from up to 100% recycled materials* (*In order to achieve quality standards, small quantities of new material may be added during the preparation process)



New design, optimised processes

Customer feedback is very valuable in the development process. The great interest shown by customers and igus® employees has prompted us to improve the platform further and the recycling program has been expanded to include all technical plastics.

We at igus® have also focussed our corporate goals strongly on sustainability issues: reducing our CO2 footprint, becoming CO2-neutral by 2025, conserving energy and resources, and avoiding production waste or feeding waste material back into the process.

"Recycling made easy" is the slogan, so the processes should be easy, too! In just three clicks, customers can feed their

material into the recycling process and receive an igus® voucher in return. The first recycling service providers have been linked to the platform, and the portfolio of recycled material has also been expanded.

Recycled material for the plastics market can be accessed simply and digitally at chainge.igus.eu.

Win-win-win

We can achieve a great deal with the Chainge network. Recycling technical plastics is an important part of the igus® vision. It is also a prerequisite for the development of products made from recycled material. As part of the Chainge

network, recycling service providers benefit from continuous material flows and access to resources. Plastics processing companies enjoy simplified access to recycled material with a quality guarantee, and customers get a simple, digital process that keeps their recyclables in the cycle.



Lena Naumann
Head of Business Unit
Chainge

The screenshot shows the Chainge website interface. At the top left, the logo 'Chainge' is followed by 'Marketplace' and 'Unsere Mission'. On the right, there is a 'Jetzt recyceln' button, a user profile icon, a shopping cart icon, and the text 'EN'. The main content area features a large graphic of a globe with the text 'Recycling made easy' overlaid. Below the headline, a paragraph reads: 'We are your experts for technical plastics. It is very important to us to make our contribution to the sustainable use and resource-saving application of plastic.' A green 'About us' button is positioned below this text. To the right, a box titled 'In 3 steps to a circular economy:' contains a numbered list: 1. Enter material specifications, 2. Specify contact details, 3. Send request and recycle. A 'Recycle now' button is located at the bottom of this box.

Moving energy made easy

e-chain systems[®] for cleanroom



**clean-
room**

igus.eu/news-ecs

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Tech up



Cost down



Proof



Sustainability

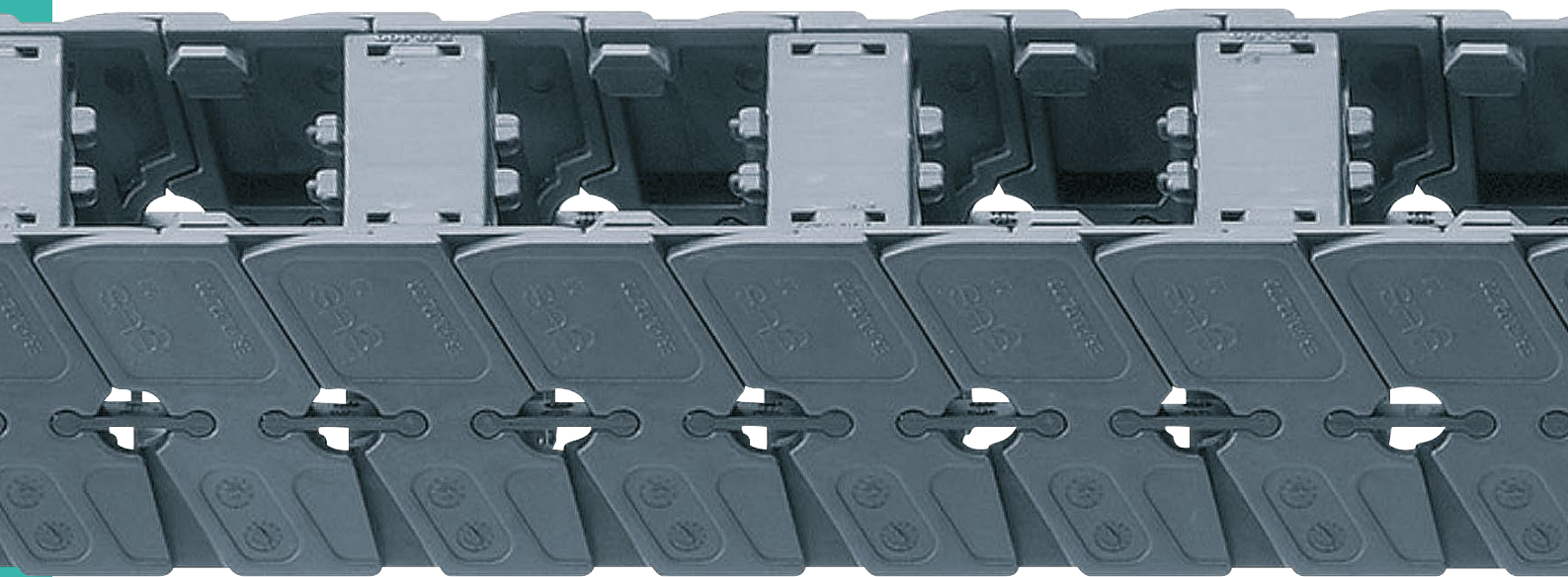


Digital

193

E6.29 e-chain® with new IPA certificate

For dry rooms and cleanrooms



New #cleanroom

The first e-chain® for dry cleanrooms

E6.29 e-chain® with new IPA certificate

The proven E6.29 series made of standard material is now certified by Fraunhofer IPA for use in dry cleanrooms for ISO Cleanroom Class 4. The E6.29 was tested in a dry cleanroom with a dew point of -40°C (corresponding to a relative humidity of $< 1\%$) of ISO Cleanroom Class 3 with three different parameter sets ($v=0.5\text{m/s}$, $a=1\text{m/s}^2$; $v=1\text{m/s}$, $a=2\text{m/s}^2$ and $v=2\text{m/s}$, $a=4\text{m/s}^2$) and has achieved the best possible result (ISO 4). Standard catalogue parts with seven interior heights and various widths and radii available directly from stock.

- ▲ Dry-room-compatible energy supply system with a long service life (tested in the igus® laboratory under dry room conditions)
- ▼ A series usable for all areas: cleanroom, dry cleanroom, and standard environments
- Certification (the first of its kind) by Fraunhofer IPA for dry cleanroom, ISO 4
- Important contribution to e-mobility (battery production, see right)
- Optional push-pull monitoring

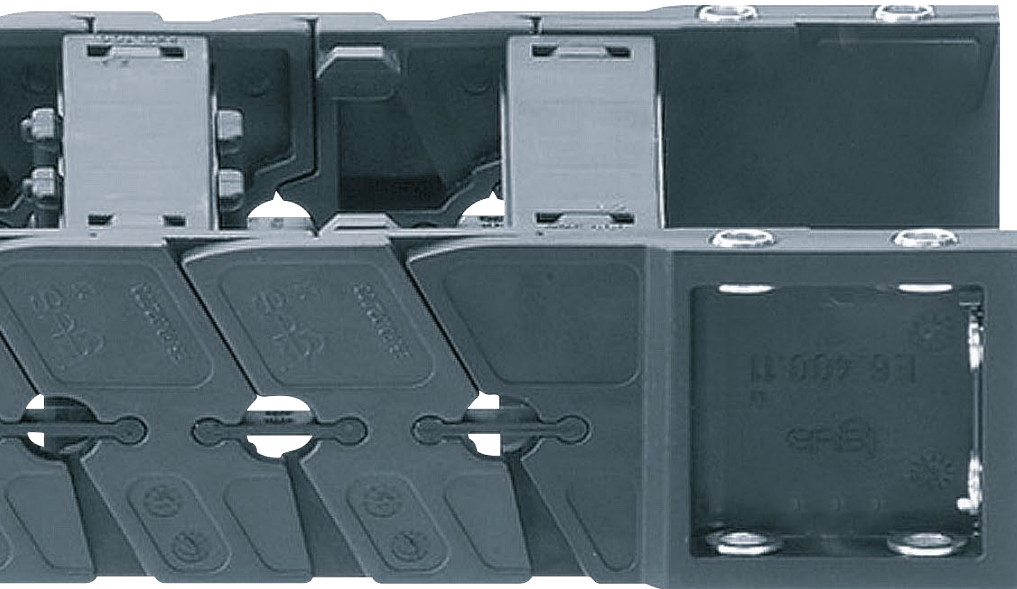


The first certified energy chain for dry cleanrooms

The days of the combustion engine seem to be numbered because the car of the future will be electric. The battery system is essential for electric mobility. So lithium-ion batteries are a key technology of our time, one that has been greatly refined in recent years. To guarantee error-free production and thus long battery life, the production process must be continuously optimised. Battery production systems require special environmental conditions achieved by combining dry rooms and cleanrooms. System automation and the increasing

dry cleanroom "tent". Classic stationary cleanrooms are a suboptimal solution for some applications due to the long planning and implementation times, large space requirement, and the long-term occupancy of valuable production areas. The new DryClean-CAPE®, a more flexible and cost-effective alternative, creates an environment that is not only high-purity, but also low-humidity. The tent-like cleanroom system consists of two different covers, resulting in dryness combined with freedom from particles due

That is why the IPA has now also developed a new type of certificate to document the ISO cleanroom classification under dry room conditions. The igus® E6 e-chain® series is the very first cable guidance system to be certified by the IPA under dry room conditions. The result is ISO Class 4. This makes igus® a pioneer in this area. **The e-chain® was tested in a dry cleanroom with a dew point of -40°C, which corresponds to a relative humidity of about <1% at room temperature (22°C).** The energy chain, which has been proven for many years, is now also suitable for safe use in dry room applications. At the same time, the E6 crossbars are being subjected to an endurance test in a dry room in the in-house igus® test laboratory. They have already undergone 10 million double strokes – and the tests are still going. The durable e-chain® made of high-performance plastics optimised for friction and wear is available directly from stock as a standard catalogue part with various inner heights, widths, and radii.

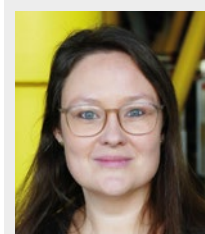


number of plants has also increased the need for reliable cable guidance that meets these high requirements. So the Fraunhofer Institute for Manufacturing Engineering and Automation IPA has teamed up with the Cellforce Group to develop a mobile

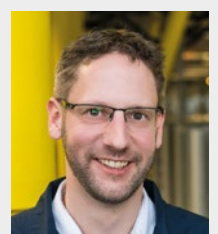
to separate, independent air treatment units. This unique combination offers an ideal, flexible production environment, and environment plays a decisive role in product quality, especially in battery cell and automobile production.



Source: Fraunhofer Institute for Manufacturing Engineering and Automation IPA



Kira Weller
Product Manager
e-chains®



Dominik Barten
Development
Engineer e-chains®

Additions to the ESD product range for the E6 system

Standard ESD protection



New #cleanroom

Three series now available from stock with ESD certificate

Additions to the ESD product range for the E6 system

Three new E6 series (a total of 88 parts) with inner heights of 29, 40, and 52mm are now available from stock as electrically conductive ESD variants and can be configured online. They can be used to reliably avoid static charges in the area of manufacturing processes for electronic components or assemblies.

- ▲ Produced customer components have no ESD faults due to static electricity
- ▼ Inclusion in our catalogue product range inventory means no individual set-up costs
- E6.ESD meets the requirements for ESD-protected areas (EPA) according to IEC 61340-5-1 and DIN EN 61340-5-1
- Series production uses fewer resources than individual order-specific production
- Optional push-pull monitoring



GLO.56.CR roller supports

Long travels in cleanrooms



Study #cleanroom

Very low particle emission thanks to optimised roller surfaces

GLO.56.CR roller supports

Advantages of cleanroom chains, including for long travels. Here, the upper run of the cleanroom-compatible E6.52 e-chain® is supported over long travels, eliminating particle emissions from gliding. Contacts are minimised by motor-controlled roller guide rocking.

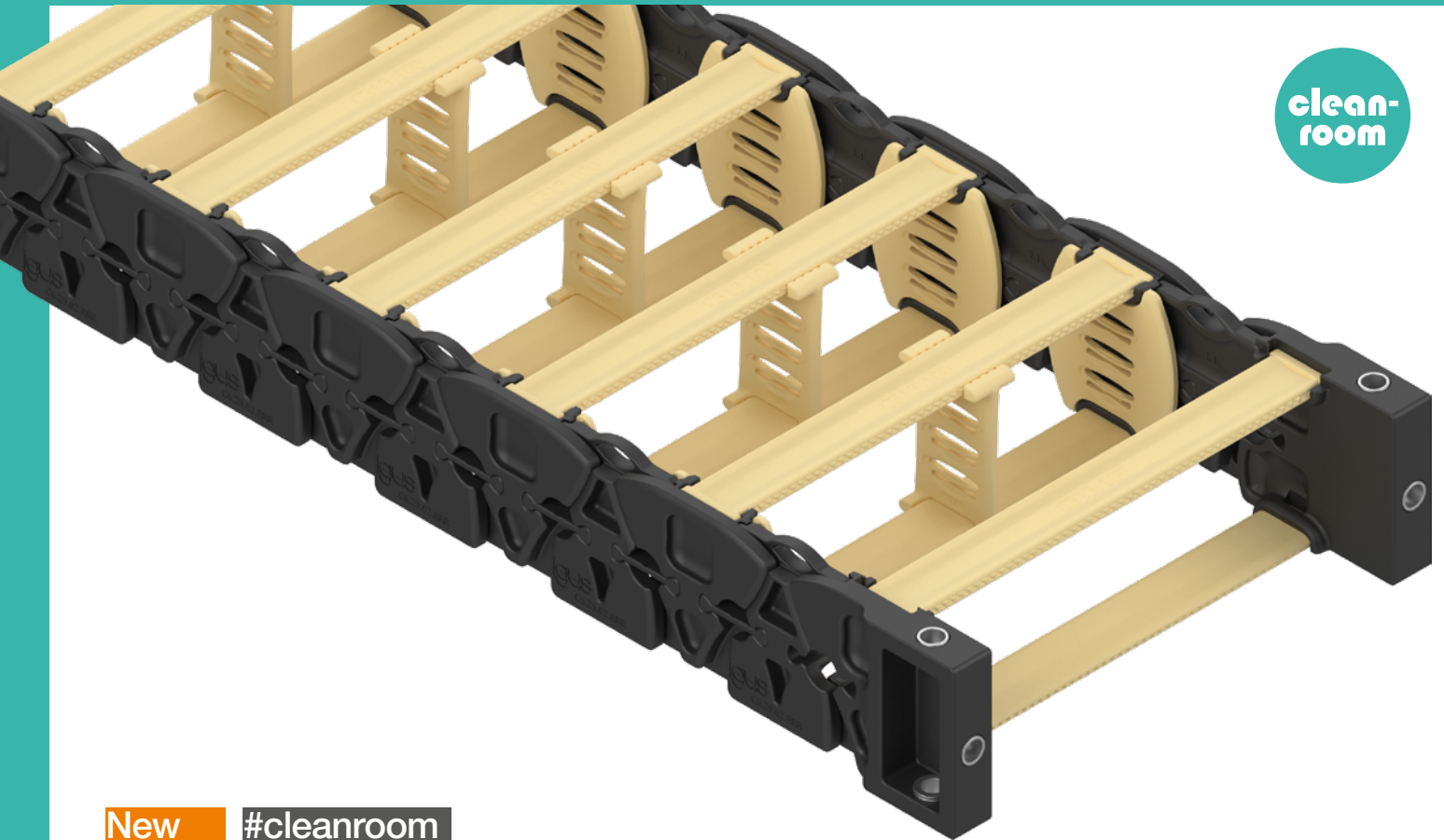
- ▲ Very low particle emission thanks to optimised roller surfaces and spring tensile force, can be motorised (optional)
- ▼ One system usable for all production environments
- IPA certification of a complete system with four supports and E6.52 with Cleanroom Class ISO 5
- No material contamination from particles in the cleanroom
- 🔗 Optional push-pull monitoring



C6.29 cleanroom e-chain®

For small cleanrooms

cleanroom



New #cleanroom

Optimised design now with reduced inner height

C6.29 cleanroom e-chain®

Addition to the successful C6 product range: clean e-chain for cleanroom applications of the future. Now with inner heights of 53mm and 29mm (new). Standard with crossbars and interior separation made of iglidur® J as an optimal gliding and friction partner for all cable jacket materials.

- ▲ Cleanroom-optimised design now with reduced inner height
- ▼ No static charge thanks to ESD side panels
- Tests in the internal igus® ISO 1 cleanroom laboratory
- No material contamination from particles in the cleanroom
- 🔗 Push-pull force monitoring



e-skin® flat ESD

ESD-sensitive in cleanrooms



Study #cleanroom

Dissipative for the cleanroom

e-skin® flat ESD

New black e-skin® flat in size SKF12 in openable and fully closed variants.
Conductivity prevents electrostatic fields and abrupt discharges caused by e-skin® flat movement.

- ▲ No further shielding of ESD-sensitive parts necessary
- ▼ All e-skin® flat accessories can be used, including CFCLEAN
- Tests in the internal igus® ISO 1 cleanroom laboratory
- Small installation space – smallest cleanroom necessary
- 🔗 Configure e-skin® flat energy supply systems online



Addition to e-skin® flat accessories

Next-level modularity



New #cleanroom

Travels of up to 5m with e-skin® flat

SKF.S.10.125.01.0 e-skin® flat with support chain

The new e-skin® flat with support chain allows longer travel distances with the cleanroom-optimised e-skin® flat system. The new larger e-skin® flat with support chain is guided in the POD SKF15C e-skin® flat and can be integrated into the existing connection element structure.

- ▲ Flexible, proven, cleanroom-compatible e-skin® flat system with CFCLEAN
- ▼ Existing system can now be used unsupported over long travels (up to five metres)
- e-skin® flat IPA ISO 1 certificates
- Small installation space – smallest cleanroom necessary
- 🌸 Configure e-skin® flat energy supply systems online



e-skin® flat in the first industry test of its kind

Highest cleanroom class after 60 million double strokes

Cleanroom-compatible energy chains from the e-skin® flat series still meet the highest Cleanroom Class even after 1.5 years of continuous use and 60 million double strokes. This result came from a test that is unprecedented in the industry. It was performed in a cleanroom laboratory set up by igus® in Cologne in cooperation with the Fraunhofer Institute for Manufacturing Engineering and Automation IPA, igus® development and certification partner for more than 17 years. "The e-skin® flat cleanroom energy chain is ideal for robots and other automation systems in electronics production in such areas as semiconductors and display production," says Andreas Hermey, Head of Development for e-chain systems® at igus®. "It is abrasion-resistant so that contamination by airborne particles is no longer an issue." Until now, however, the level of particle abrasion in the

high-performance plastic after long, intensive use has been unclear. To determine that level, igus® initiated a test that is unique in the industry so far. Part one of the experiment was conducted in igus® own laboratory. The energy chain moved in an environment with normal levels of dust and dirt for around a year and a half, during which time it performed 60 million double strokes.

The second part of the test took place in the clean room laboratory. The heart of the setup was three so-called laminar flow boxes equipped with high-performance filters that enable tests in uncontaminated air.

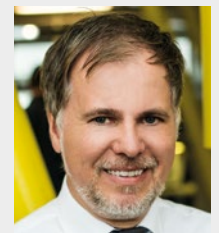
The worn e-chain® was in motion three times (100 seconds each time) at different speeds. Sensors detected particle concentration in the surrounding air. "Even after 60 million double strokes, our e-skin® flat e-chain® still qualified for the highest cleanroom class," says Hermey. "This finding offers cleanroom production facility operators additional confidence."



Kira Weller
Product Manager
e-chains®



Dominik Barten
Development
Engineer e-chains®



Andreas Hermey
Head of Research
and Development
e-chains®

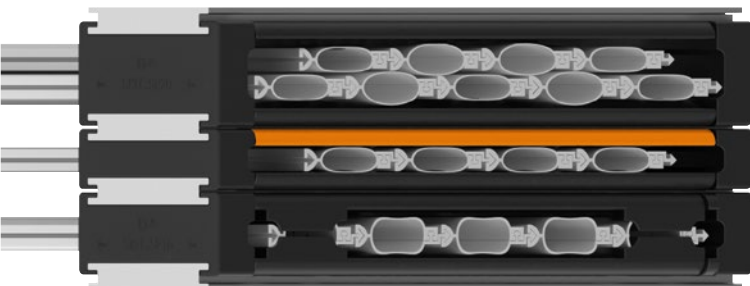
New #cleanroom

Simplified strain relief

Consistent strain relief for each layer

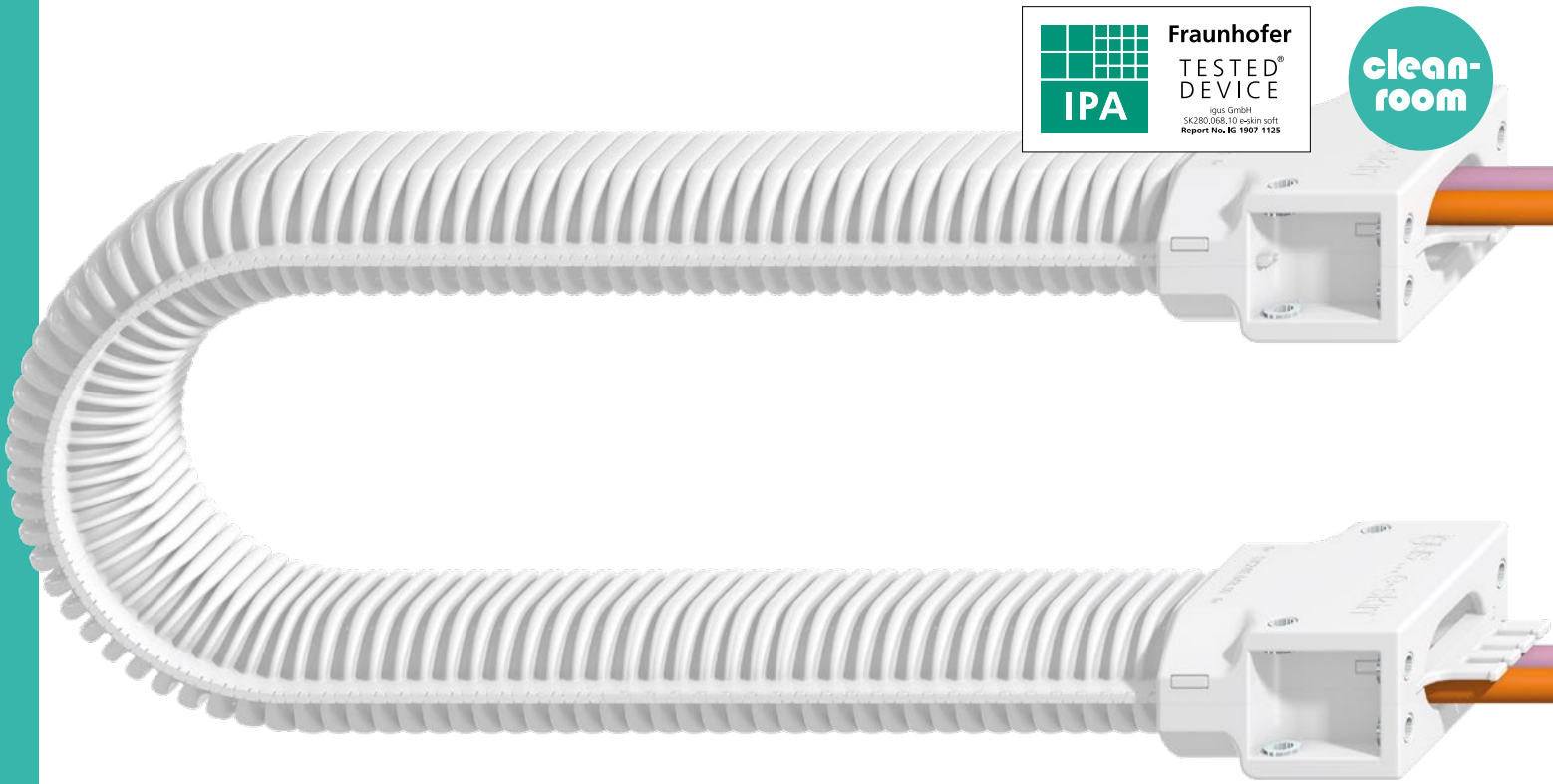
Simplified strain relief with the mounting bracket. Continuous one-piece element for defined cable diameter per layer. This reduces the number of components in the mounting bracket and allows quick assembly.

- ▲ Simplified ordering process for defined mounting bracket assemblies
- ▼ Few parts in the mounting bracket and faster system assembly
- e-skin® flat IPA ISO 1 certificates
- Small installation space – smallest cleanroom necessary



e-skin® SKS24

Highest cleanroom class



New #cleanroom

New intermediate sizes for a proven design

e-skin® SKS24

Proven design for the highest cleanroom class. Addition to the e-skin® product range. The SKS24 fills the gap between the smallest e-skin® SKS20 and the SKS28. The shells form an inner height of 24mm and inner width of 48mm. The side links and the locking mechanism have the thickness of the SKS28, maximising the unsupported length.

- ▲ Easy filling with proven zipper opening principle
- ▼ Soft material for small installation spaces
- ISO Class 1 IPA certificate for the SKS28 (identical dimensions)
- Individual hoses and cables can be replaced



e-skin® SKS20 / triflex® CSCS

Clean SCARA Cable Solution



New #cleanroom

Cleanroom compatible for high-speed SCARA applications

e-skin® SKS20 / triflex® CSCS

Based on the experience of the SCARA Cable Solution developed in 2020, a certified cleanroom variant is now available: the Clean SCARA Cable Solution. The optimised rotating mount connections allow up to ISO Class 2 (IPA-certified). In combination with the SKS20 e-skin® design, which has been proven in the highest cleanroom class, highly dynamic applications can also be implemented.

The SKS20's proven zipper opening principle allows quick, easy cable filling. The new Clean SCARA Cable Solution is available in all known connections of the standard SCARA Cable Solution.

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



Moving energy made easy

In all axes



igus.eu/news-ecs

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Tech up



Cost down



Proof



Sustainability

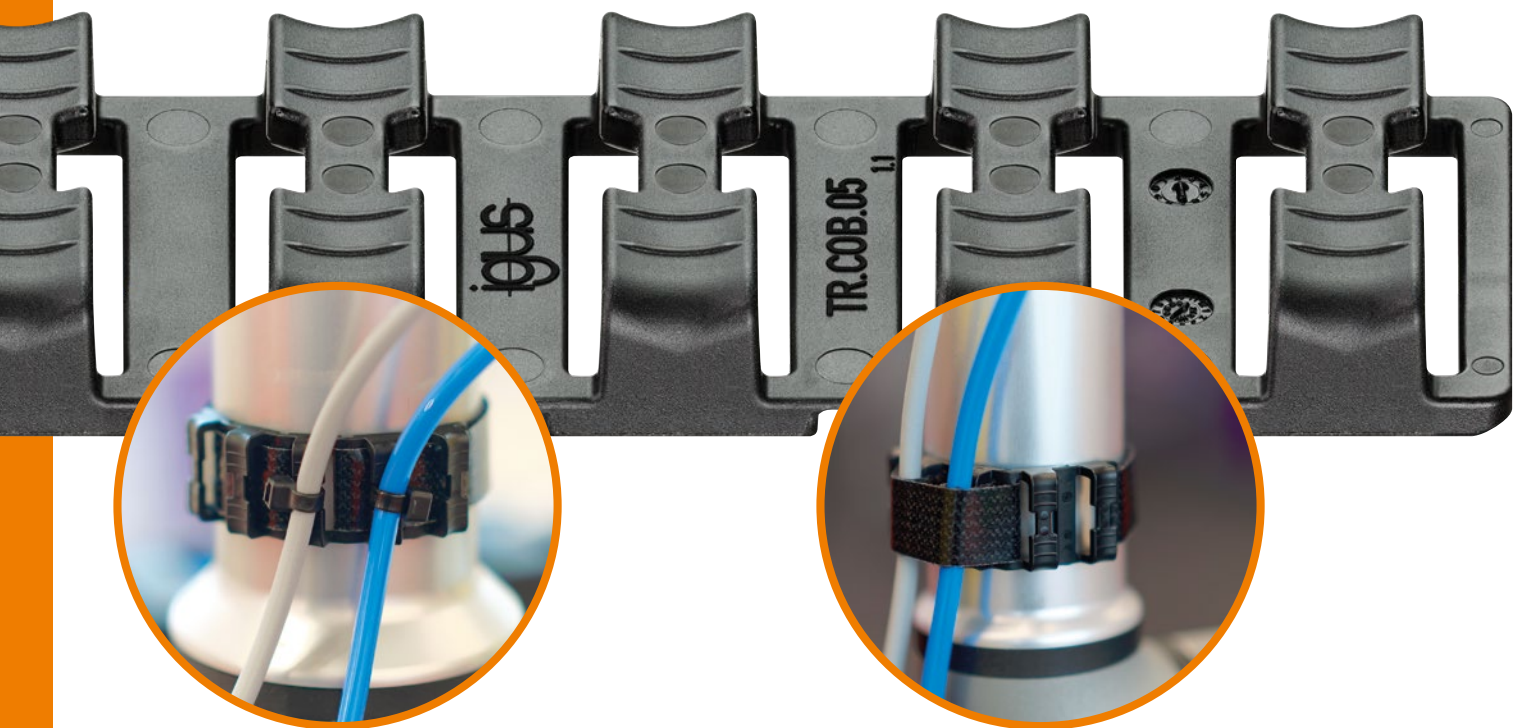


Digital

205

triflex® COB Cable Clip

Attaches easily anywhere



New #superlowcost

Easy, universal use

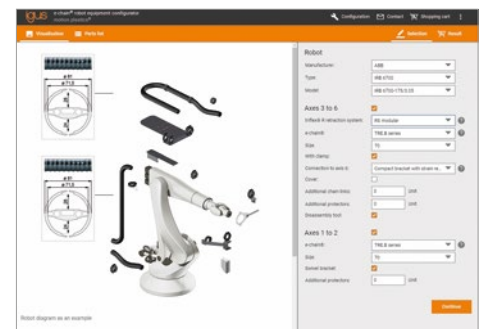
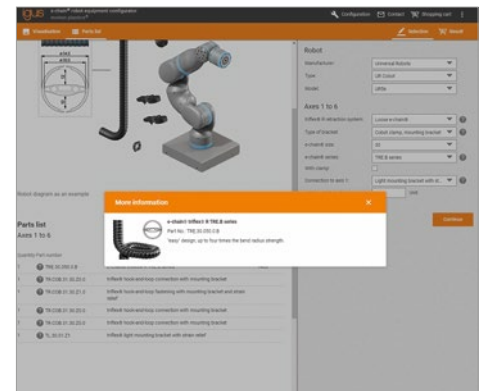
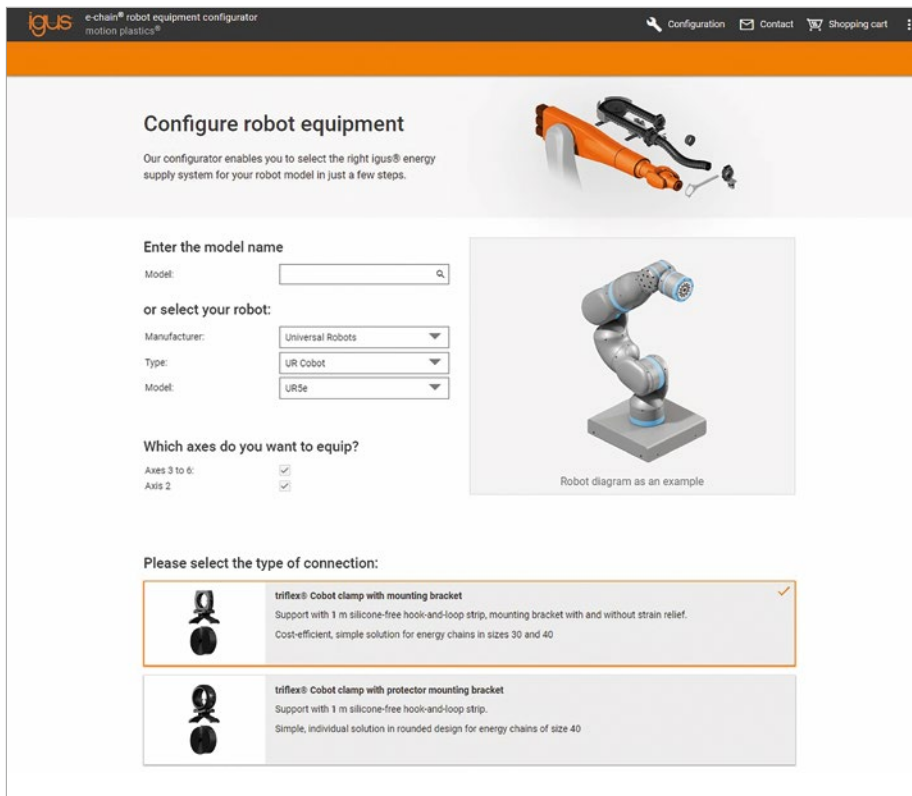
triflex® COB Cable Clip

The igus® cable clip allows almost interference-free attachment to surfaces in a wide variety of shapes and diameters. The flexible design adapts to any contour, minimising installation space and the risk of injury. The silicone-free hook-and-loop strip included in delivery provides the necessary grip and can also be used in the automotive sector. The option of running the hook-and-loop strip under the cable clip ensures a secure grip for even small diameters. Up to five cables of different diameters can be attached to the cable clip either with cable ties or by bending the hook-and-loop strip.

- ▲ Quick, easy installation on surfaces with a wide variety of shapes and diameters
- ▼ Can be divided into up to three segments
- Already in use with various robot models
- Cable ties can be dispensed with if the hook-and-loop strip is bent
- Configurable on different robot models in the robot equipment configurator



1.5 million configurations



New

Configure your energy supply system quickly and easily

Robot equipment configurator

With around 500 robot models from 13 different manufacturers, the robot equipment configurator offers the perfect basis for configuring an energy supply system suitable for an industrial robot. 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.

- ▲ About 500 robot models from 13 manufacturers can be configured
 - ▼ Simple, clear menu navigation saves time
 - More than 10,000 call-ups per year
 - 🎧 1,500,000 configuration options for an energy supply system suitable for an industrial robot
- www.igus.eu/erk



tube-trough support tray

Compact lightweight



New

The support tray for small chain series

tube-trough support tray

Developed as a compact, very light support tray for our Low Cost Automation linear robots, the new tube-trough support tray is also ideal for many of our small chain series.

- ▲ Especially compact, lightweight modular system
- ▼ Standard parts make it less expensive than sheet metal trays
- Testing in our own Low Cost Automation showroom
- Lightweight construction reduces material usage



Background

Individually adapted to your requirements

The tube-trough support tray's most prominent feature is its lightweight construction. The aluminium tubes also have the advantage of giving dust and chips no chance to settle in the trough. The tube-trough support tray can be attached onto various C-profile rails or directly onto a smooth surface, and the tray's aluminium tubes can be individually tailored to your requirements.

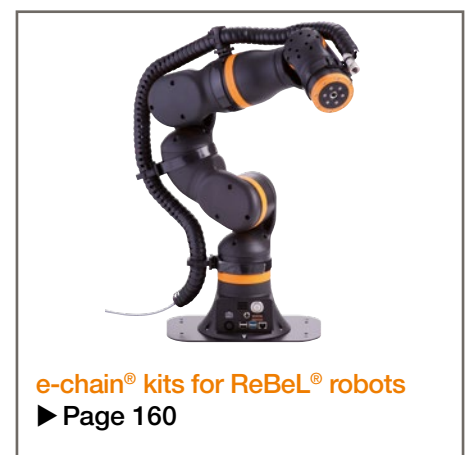
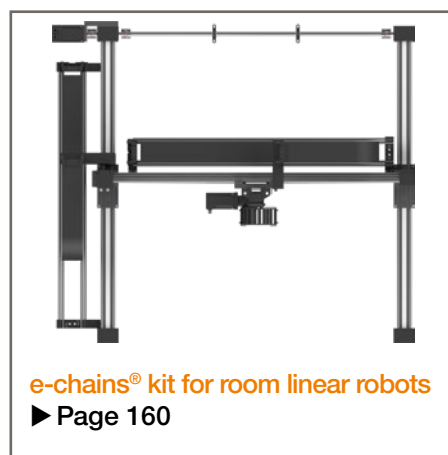


Christoph Koch
Product Manager
e-chains®



Suitable e-chain® kits

More information about our new low-cost, modular e-chain® system specifically for our LCA robots



SRM-L light steel rotation module

Simply reliable rotation



New

For various chain widths

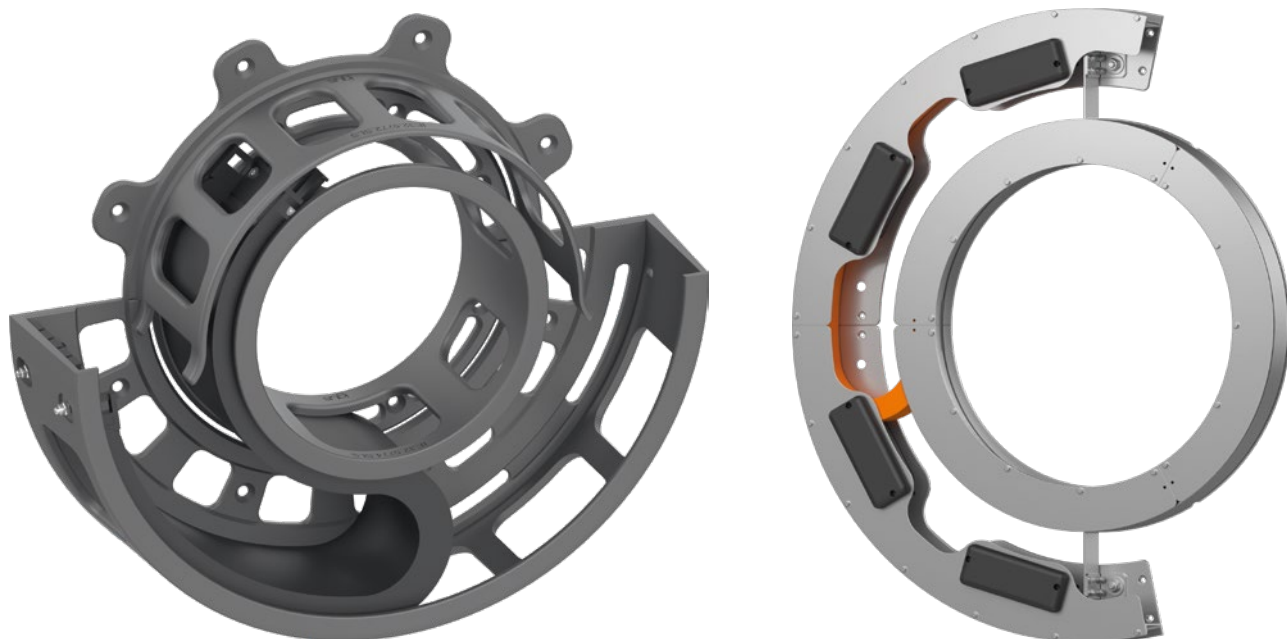
SRM-L light steel rotation module

A standardised guide trough for various chain widths, including preparation for smart plastics end position control.

- ▲ Various chain widths in one guide trough
- ▼ Price reduced by up to 40% compared to SRM
- Design based on the proven PRM system
- Fewer components and 40% less weight compared to the SRM
- Preparation for end position control



Vertical, rotating energy supply



Study

Reliable solution for vertical applications

PRM-V Polymer Rotation Module with outer diameters of up to 500mm

SRM-V Steel Rotation Module with outer diameters of up to 2m

Reliable rotating energy supply for vertical installation with additional guide elements (magsnap and guidelok rockers).

- ▲ Reliable solution for vertical applications
- ▼ Up to 50% cost savings as standard
- Service life test of 5 million cycles successfully completed in the igus® laboratory and more than 20 systems delivered for a production project (SRM-V), comparable application (horizontal) tested to ~2.5 million cycles (PRM-V)
- Have your energy chain recycled in the igus Chainge recycling program at the end of its life cycle: igus.eu/chainge



Theatre e-spool® energy chain system

For theatres and stages



New

Tension-optimised e-chain® is the new standard

Theatre e-spool® energy chain system

The energy chain system for stage and theatre applications following DIN EN 17206 and DGUV Principle 315-390. The e-spool® is a cable guidance system with automatic retraction (spring tension). A new tension-optimised e-chain® is guided with a drum and uses an integrated retaining spring to ensure the correct length and tension for the energy supply system. The twisterband connects the drum with the shaft end block, which serves as an interface to the cables.

- ▲ Different media types and sizes safely and reliably guided in one system
- ▼ Price reduced by up to 50% compared to previous e-spool® solutions
- Developed following DIN EN 17206 and DGUV Principle 315-390
- Optimised manufacturing process through standardised parts
- Spring force/rotary sensor monitoring (optional)



30m without interruption



Study

No slip ring, very compact

Microphone Motor Reeler

The Microphone Motor Reeler closes a gap in the field of stage technology and is particularly versatile due to its compact size and lightweight. The igus® twisterband eliminates the need for a slip ring. Uninterrupted sound transmission can thus be guaranteed with an extension length of 30m.

- ▲ No cable interruption/slip ring
- ▼ No additional load-bearing element necessary
- twisterband proven as a slip ring alternative in hundreds of e-spool® applications
- Contact points and sliding contacts no longer require replacement/maintenance



Complete zig-zag system

Up to 15m height for trusses



Recycling made easy –
Change
by igus®

New

Standardised, modular ... can be ordered online

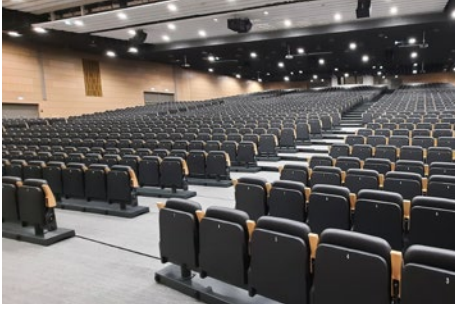
Complete zig-zag system

The new standard in the theatre and stage technology industry features greatly reduced weight on trusses; modular design and travel lengths of 5-15 metres. The new system is rounded off with fasteners for trusses, a support plate on the moving end, and an optional safety package that can be ordered based on DIN EN 17206 and DGUV Principle 315-390.

- ▲ Standardised proven design
- ▼ Price reduced by up to 20% compared to the previous design
- Based on the requirements of DIN EN 17206 and DGUV Principle 315-390
- Have your energy chain recycled at the end of its service life with the igus® Change recycling program, regardless of manufacturer: igus.eu/change



Multifunctional hall becomes a ballroom at the push of a button



Gepber Szinpad, a Hungarian company, is developing a multifunctional hall for over 2,000 people. What is exceptional is that the hall transforms from a ballroom into an auditorium at the touch of a button – a button that activates a kind of transformer with 43 moving platforms. igus® energy and data cables from the chainflex® range (including CFBUS.PVC.045) follow movement in 3400-series energy chains (3400.100.075.0).



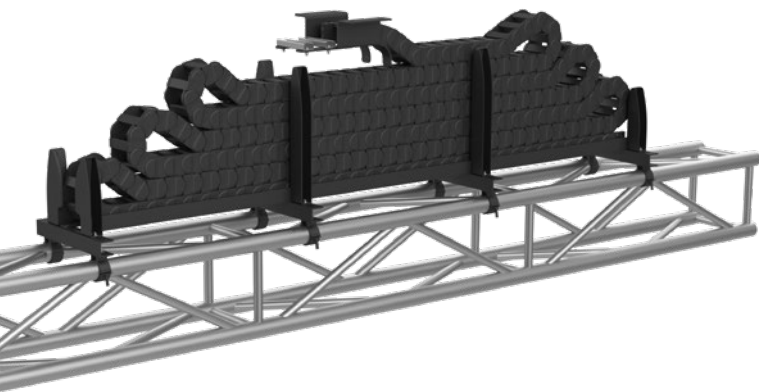
Study #lowcost

Light and cost-effective

Low-cost zig-zag e-chain®

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.

- ▲ Weight is less than half of that of the standard zig-zag basket, allowing a higher payload
- ▼ Price reduced by up to 50% compared to the standard zig zag basket
- Developed following DIN EN 17206 and DGUV Principle 315-390
- Lower drive power thanks to weight reduction



e-chain® reel with socket trolley

Clean air thanks to shore power



New

Mobile socket for 8/10kV medium voltage cables

e-chain® reel

Move and position medium-voltage cables with 8/10kv safely and flexibly.

- ▲ Move the socket trolley to the connection point for flexible shore power connection
- ▼ Long cable service life thanks to guidance with a special chain with roller inserts
- Arc fault protection thanks to a tested outlet box
- No harmful emissions: shore power instead of vessel engines running
- 🔗 Also available with smart condition monitoring



Clean energy supply for ships

igus® solutions contribute to environmental protection and an improved CO2 footprint

igus® solutions for shore power supply, such as the e-chain® reel, use generators to provide ships with power while they are in port so that power need not be produced on the ship. This protects the environment and the health of those in the port environment.

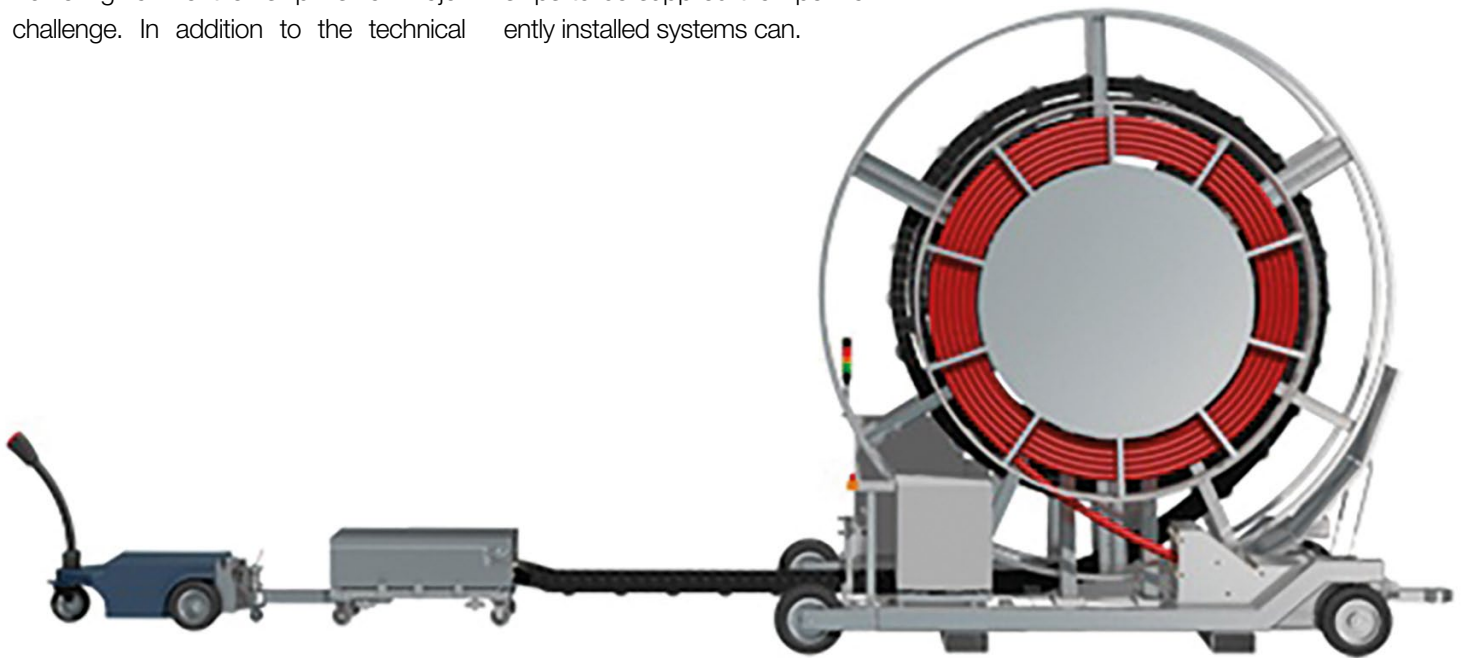
Powering an entire ship is a major challenge. In addition to the technical

challenges of the power supply (such as the right voltage and frequency), the place where the cables coming from the ship have to be connected also changes from ship to ship.

The igus e-chain® reel is a motor-driven, reelable e-chain system® equipped with a special chain with roller inserts that can be used to flexibly position the socket within a range of up to 100m. This allows more ships to be supplied than permanently installed systems can.



Martin Tiling
Industry Manager
Shore Power



e-tract 2.1 cable retraction system

E-mobility made easy



New

Slimmer and more compact ... for a tidy charging station

e-tract 2.1 cable retraction system

The next step in the evolution of the e-tract, the solution for automatically cable retraction – ideal for electric car charging stations. The new version is now even slimmer and more compact and offers a better ratio of extension to total cable length in the system. A wallbox (11kW) is integrated into the system.

- ▲ Cable extension at a height of about 1.2 metres
- ▼ Less cable length required for the same extension length
- 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



More compact with the same cable extension length (5m)

e-tract is a solution for automatic rewinding of a charging cable. This prevents hazards and cable damage due to improper winding or obstructing cables. The e-tract is used in applications where a mobile terminal is connected to a cable and was previously rolled up by hand. Multiple deflection means that long extension lengths are possible where there is limited installation space. A slip ring is dispensed with completely.

After presenting the study last year, we intensively refined the system: we used roller cages to greatly reduce the overall cable length required in the system – without losing extension length (5m in the current design). The semicircular roller cages can move much closer together than the rollers used previously. Besides reducing cable length, this greatly reduces the height of the cable retraction system (by 25%, from 1.6m to 1.2m). The overall e-tract therefore now has a much more compact design. Openable

crossbars on the roller cages prevent the cable from coming off or tangling and allow the charging cable to be installed and replaced quickly and easily. The linear grid on the retraction mechanism makes it easy to lock the charging cable in the desired position and release it again.

The e-tract 2.1 is currently designed for a charging power of 11kW, with the pulley-type retraction system allowing charging at full power, regardless of whether the cable is fully extended or retracted.



Christoph Koch
Product Manager
e-chains®



Thilo Jaeker
Deputy Head of
Research and
Development



e-tract 2.0 vs. e-tract 2.1

Less space required thanks to its innovative design. The new roller cages make the e-tract 2.1 approx. 25% smaller than its predecessor.

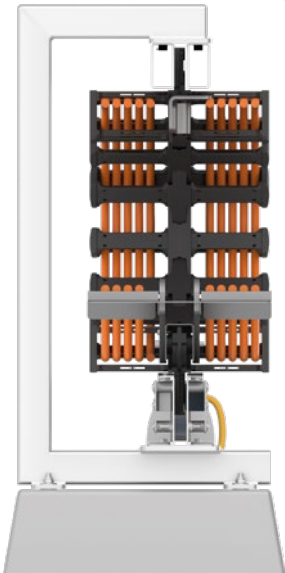


e-tract 2.0
2022 predecessor modell



drive-chain 2.0 with linear drive

For very long travels > 1,000m



Update

Extreme dynamics and very long travel distances with a wear-free drive

drive-chain 2.0 with linear drive

The world's first e-chain system® with its own drive, now almost wear-free with a linear motor. For very long travel distances (1,000m and more) with extreme dynamics and long operating times. For ASC (automated stacking crane) next-generation cranes. The lower mass allows higher acceleration and speed, and the drive-chain 2.0 also offers a much longer service life than do standard energy chain systems.

- ▲ Virtually wear-free linear drive for even less friction over very long travel distances
- ▼ Shorter cable lengths, due to central feed, resulting in lower cable costs when purchasing
- Reduced energy consumption thanks to 4-6t less moving mass on craned



guidelok swing GLO.S.E2i.21.025

Compact design for cranes

Recycling made easy...
Change
by igus



Update

New design requires less space

guidelok swing GLO.S.E2i.21.025

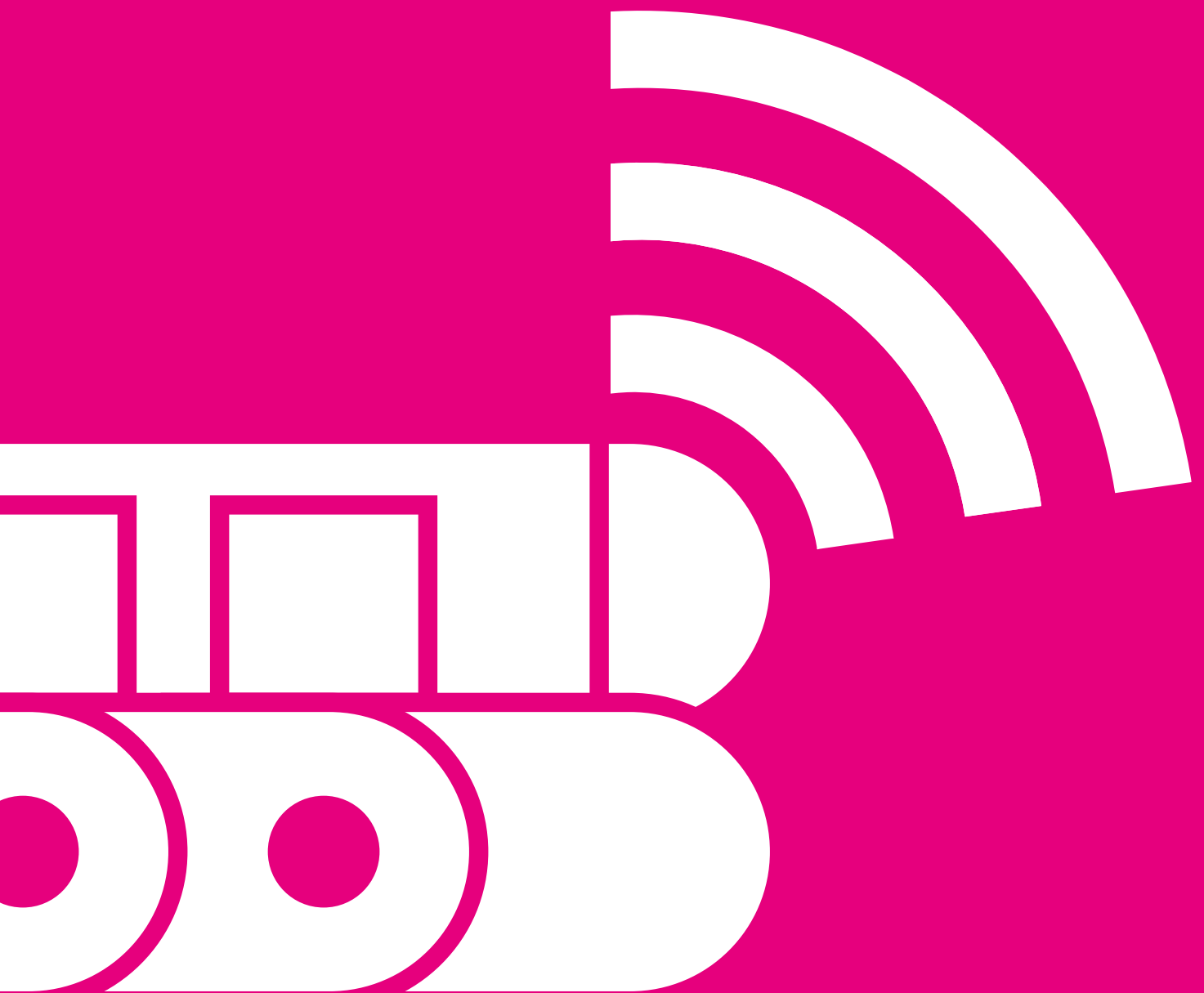
New, more compact design – larger gliding surfaces in the outer radius and even less space required on the crane girder.

- ▲ More space between crane girder and e-chain® (8-19mm), allows larger bend radii
- ▼ No guide trough required
- Already successfully in use in many applications including the igus® factory
- Have your energy chain recycled at the end of its service life with the igus® Change recycling program, regardless of manufacturer: igus.eu/change
- 🔗 Online tools for digital configuration and individual service life calculation



Moving energy made smart

smart plastics



igus.eu/news-smartplastics

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232 smart plastics meets
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superwise - igus® smart service



i.Sense TR.B

Flexible ... and safe



new

First condition monitoring system for robot e-chains®

i.Sense TR.B

New i.Sense TR.B sensor enables condition monitoring for triflex® R energy chains in multi-axis applications

- ▲ Longer service for dress packs
- ▼ Avoiding unplanned downtimes on robots
- Ongoing test series in the industry's largest test laboratory for moving power transmission systems on industrial robots
- Reusable after correct system repair
- 🔗 Digital connection to PLC customer control system without additional software costs



Application example

Flexibility meets safety: first condition monitoring system for robot e-chains® from igus®

Thanks to the new i.Sense TR.B sensor, intelligent condition monitoring is now also possible for the triflex® R multi-axis energy chains from igus®.

Increasing material and energy efficiency, compensating for supply bottlenecks through domestic production and alleviating labour shortages: these are, according to the 2022 trend index at the world's leading trade show automatica, some of the most frequently cited reasons why industrial robots are important for the German economy. However, one thing above all is essential for an industrial robot to work reliably: safe cable guidance. Robot cables must withstand numerous flexing cycles as well as loads due to torsion and tension. With triflex® R, igus® has developed a round energy chain with a defined bend radius specifically for industrial robots in order to protect the cables even during complex dynamic movements. After all, a chain break can be disastrous: plant downtime, production stoppages and delivery delays cost time and money. The motion plastics® specialist igus® has developed a new and cost-effective solution to determine chain breakage at lightning speed and prevent expensive consequential damage: i.Sense TR.B - a real-time breakage monitoring system for the multi-axis triflex® R energy chain.

With i.Sense TR.B, the proven i.Sense breakage monitoring of igus® smart plastics is now also possible for dynamic, multi-axis applications. Customers can increase the safety of their robot systems with an investment of just a few hundred euros. The i.Sense TR.B sensor is connected directly to the PLC customer control - without additional software costs. If a chain link breaks, the system detects the change in length of the rope installed in the chain and can accordingly send

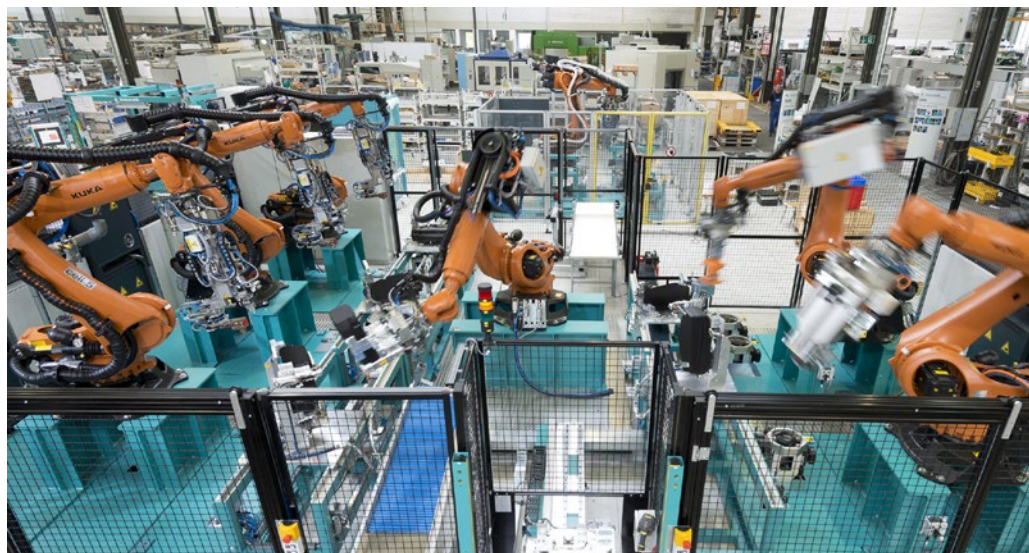


out a digital signal to the system control. Instant breakage detection enables immediate maintenance measures and avoids unplanned downtime and total failure in the event of individual chain link breakages. "Particularly in applications such as automotive production lines with extremely high output, any downtime can cause costs of several €100,000. Real-time status monitoring of the energy supply system in industrial robots therefore offers users considerable added value," explains Richard Habering, Head of Business Unit smart plastics at igus®. With the help of numerous test series in the industry's largest test laboratory, igus® is continuously working on further optimising the quality and durability of its products. The combination of flexible triflex® R 3D chain with high tensile

force absorption and i.Sense TR.B sensor makes it possible to safely guide and protect robot cables - and thus significantly increase their service life. Condition-based maintenance using the TR.B sensor also makes maintenance more sustainable, as users can avoid unnecessary or premature product replacement. And if there is a chain break, the sensor can be reused after correct emergency shutdown of the system.

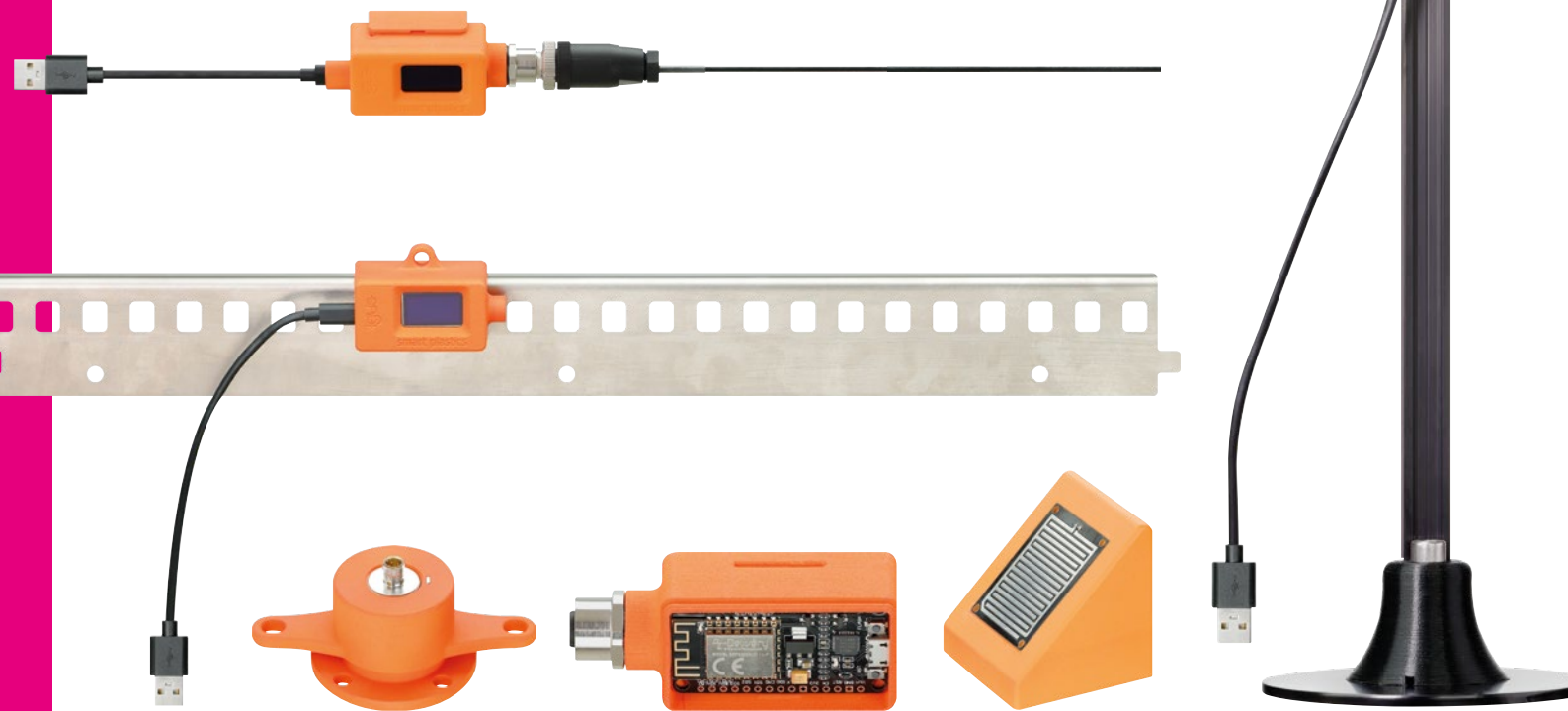


Richard Habering
Head of Business Unit
smart plastics



smart plastics DIY tools

Smart low-cost sensors



new

Small in size, great in performance ... the easiest way to enter the world of smart plastics for moving applications

smart plastics DIY tools

With the new low-cost sensor technology from smart plastics, you can now measure moving applications and get data-driven improvements - Tech up. Cost down.

- ▲ Data-based product and process quality improvement
- ▼ Cost-effective and easy entry into the sensors world; also suitable for DIY applications
- Years of tested and proven inserts in the 3,800 m² igus® test laboratory
- Low-cost sensors save expensive product development effort
- The digital evaluation unit is included





new

Full control with smart bearings

i.Sense BRG mini sensor

New low-cost sensor technology allows cost-effective real-time condition monitoring for (almost) any igus® plastic product ... including direct connection to the PLC system control

- ▲ Condition monitoring for (virtually) all igus® polymer products
- ▼ Avoid unplanned downtime with real-time status display
- Ongoing test series in the industry's largest test laboratory for high performance polymers
- Minimal material requirements for the integrated sensor
- 📶 Comprehensive connectivity for integration into predictive maintenance concept with the optional i.Cee module



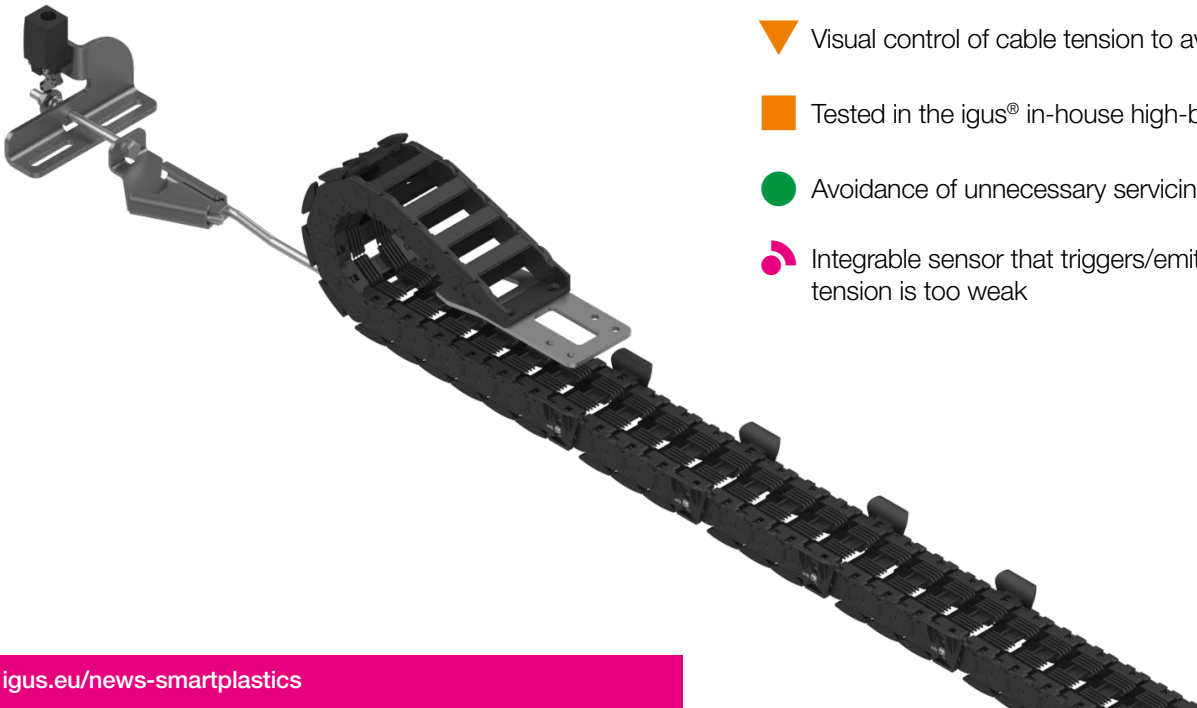
new

Smart tension monitoring

Cable tension indicator as smart sensor option for autoglide 5

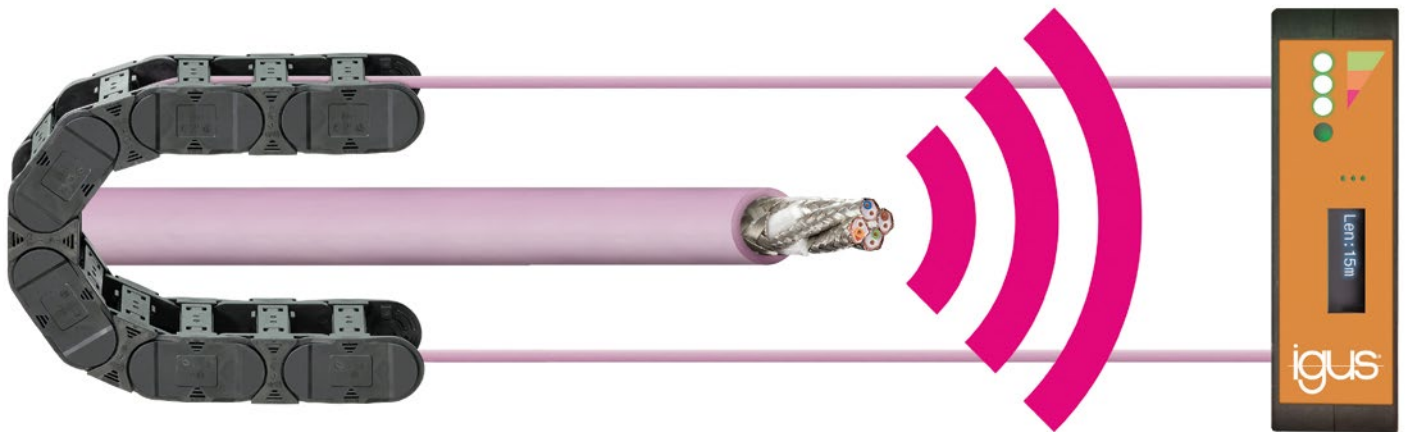
A spring can be retrofitted so that the correct cable tension can be intuitively set.

- ▲ Easier, more intuitive adjustment of the cable tension
- ▼ Visual control of cable tension to avoid failures
- Tested in the igus® in-house high-bay warehouse
- Avoidance of unnecessary servicing work
- 📶 Integrable sensor that triggers/emits a signal if the cable tension is too weak



i.Sense CF.D

New with optical status display



new

**Detect cable stress early ...
better and more accurately than ever before**

i.Sense CF.D

The igus® monitoring module with its unique status display measures the distance to the cable's area of risk

- ▲ Monitoring of data transmission quality
- ▼ No additional hardware, no additional software
- Ongoing test series in the industry's largest test laboratory for dynamic cable applications
- No extra cores needed
- 🔗 Optional multi-connectivity via additional i.Cee module possible



Application example

Detect cable stress at an early stage and more precisely than ever before, with i.Sense CF.D

New with unique status display: the i.Sense CF.D detects stressed areas of cables at an early stage; for the first time, it determines the distance to the area of risk.

Monday morning in a car factory: a robot is welding body parts together. Thanks to a seventh axis, it moves in a large work area, its data supplied with Ethernet cables. A technician opens the welding robot's control cabinet to see whether all Ethernet cables are working correctly. But the i.Sense CF.D sensor's coloured signal lamps show that the transmission quality in one cable is weakening. Three different types of Ethernet cable are often used on the robot: a static cable from the control cabinet to the seventh-axis e-chain®, a chainflex® bus cable in the e-chain system®, and a chainflex® robot cable for torsional movement on the robot. External influences can cause transmission quality malfunctions. But the cables are very long and difficult to reach in many places. In such cases, searching for and fixing errors is often time-consuming and expensive. We have therefore developed a new function for the i.Sense CF.D monitoring module that is so far offered nowhere else in the world: an optical status display with precise information on the distance to the suspected fault location.

i.Sense CF.D continuously measures transmission properties and various electrical parameters over millions of cycles. The system thus not only detects data losses in real time, but also identifies the position of the stressed area of the cable very precisely. "This information, which appears directly on the module's OLED display, enables users to identify the area of risk faster and in a more targeted manner than ever and immediately replace the cable for the segment in question without trial and error - and without additional tools or software costs." i.Sense CF.D can be set up just as quickly. Simply install the module in the control cabinet and connect the cables to be monitored, then start right away. Adding i.Cee to the system is also very easy. The multifunctional module is compact, takes up hardly any space in control cabinets and, like i.Sense CF.D, can be set up in just a few simple steps. A minor intervention allows automatic cable monitoring, fault management, and predictive maintenance planning via a digital control system. All live cable parameters - such as number of strokes and running performance in kilometres - can be aggregated on a dashboard. Technicians usually have only two options for servicing cables subject to

heavy mechanical stress. They can be reactive, replacing cables when they are already defective, but this usually means unnecessarily long, expensive downtimes. Or, as a precautionary measure, they can replace cables at specific intervals, accepting the higher costs when cable service life is not exhausted. i.Cee changes all that. If defined limits are exceeded, the system can automatically trigger an alarm or an emergency stop in the system. This prevents immense consequential damage or even total failure, which can cost tens of thousands of euros in automotive production or the crane industry, for example. The i.CEE module also automatically calculates the most economical time for maintenance operations and cable changes. So it's ideal for reducing both maintenance costs and downtime. A CF.D module pays for itself in a few months, and ROI is over 500 percent per year.



Richard Habering
Head of Business Unit
smart plastics



EC.W wear sensor now in the e-chain® online configurator

Click, click ... and smart



new

Extending service life made easy ...

EC.W wear sensor now in the e-chain® online configurator

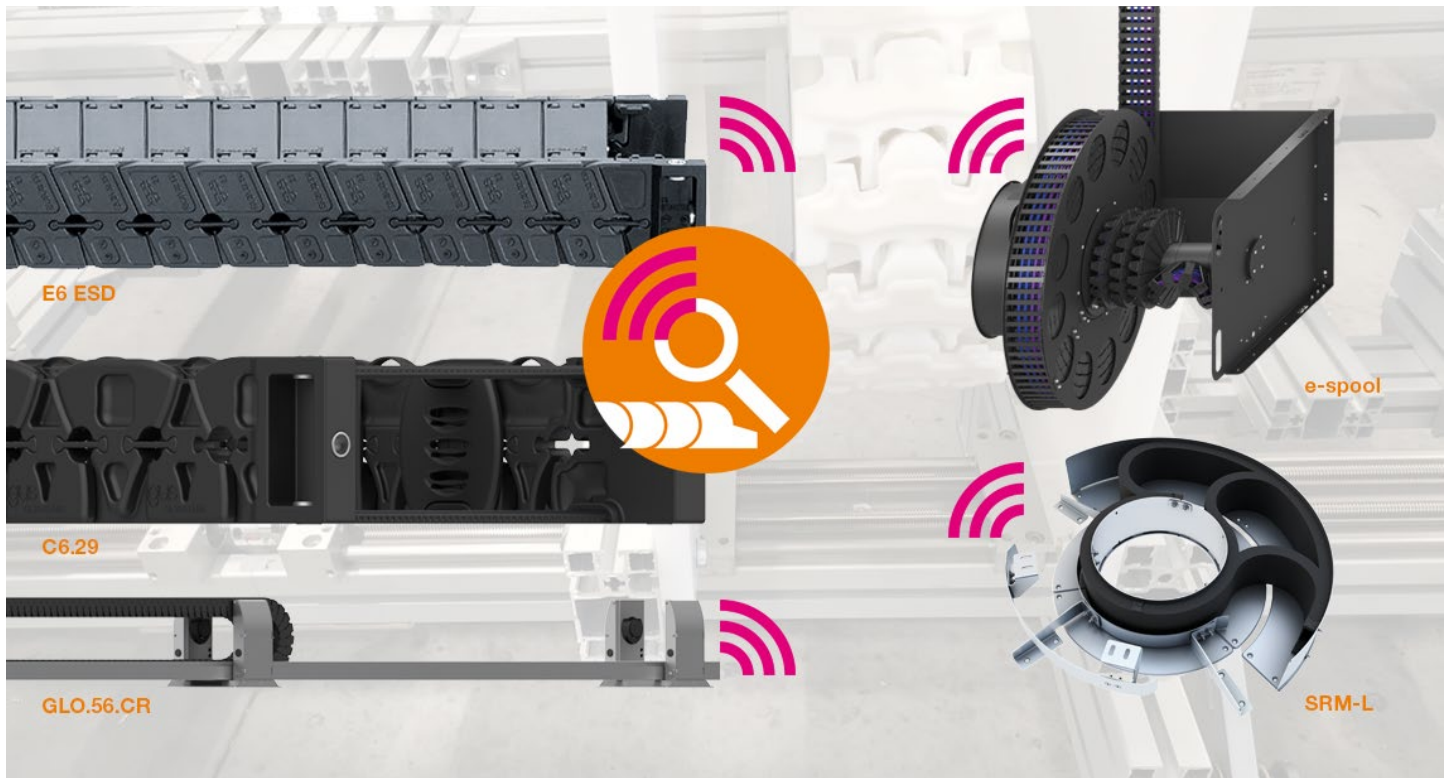
In the "e-chain® expert", customers can now directly equip their ready-to-connect energy chain with smart condition monitoring - and avoid unnecessarily early replacement.

- ▲ Easily extend the service life of your energy chain
- ▼ Add smart condition monitoring directly without extra compatibility check
- Over 1,000 daily users in the online configurator
- Online design of energy supply systems saves immense coordination effort
- 🌐 Can be used online 24/7 - in over 12 languages



Moving energy made smart

Lean, green ... and smart



new

Digitalisation on all travel types ...

Moving energy made smart

... proven smart plastics technology also as a standard for more and more e-chain® news and current top sellers in the energy supply sector.

- ▲ Increase in machine availability as well as maximum service life
- ▼ Elimination of unplanned downtime or machine failures
- More than 2,500 successful customer projects with i.Sense smart condition monitoring
- Unplanned service deployments can be prevented - eliminating 100km of travel saves about 3.6kg of CO²
- 📶 Remote access to real-time machine data eliminates repeated physical trips



smart plastics meets orange service



new

Maintenance of e-chain systems® made even easier ...

superwise - igus® smart service

For the first time, the superwise service combines first-class product service with the latest smart plastics technology in one package.

- ▲ Ensure the required overall system effectiveness at any time
- ▼ Order spare parts, maintenance service or monitoring devices with just one click
- Numerous proven smart plastics projects as well as ongoing maintenance contracts
- Use-based product replacement reduces unnecessary material costs
- 🎯 100% transparency in the smart plastics customer portal at all times



igus® takes care of your application!

Through the systematic and AI-supported evaluation of the customer's application or project data, igus® offers a whole range of advantages with superwise. For example, we can actively inform you about price, delivery time and possible product improvements before an upcoming exchange. superwise is an igus® service that protects you from unexpected failures of your e-chain® application. An igus® employee will call you as soon as the product service life of the e-chain system® is nearing its end or an unforeseeable event endangers your production. Should something unforeseen happen, smart plastics components protect your e-chain® application and prevent a total failure by switching off at lightning speed. Using the online portal, you can see an overview of all your igus® e-chain systems® and their current status. You can plan and carry out maintenance and retrofit work in combination with other business processes to ensure your production runs smoothly.

superwise Basic: all system data is displayed and a service life forecast is created based on your information and the well-known algorithms of the tried-and-tested online service life calculator. In good time before the end of the safe operating time of the igus® e-chain system®, the igus® sales department will make you an offer to replace the system!

superwise i.Sense: the smart plastics condition monitoring components reliably prevent total failure due to broken chains, blockages or cable damage. In the event of a shutdown, you will be informed immediately by e-mail or SMS, and the igus® sales department will also be notified so as to arrange for fast deliveries if necessary. All reports are saved with measured values in the portal and can be evaluated at a later point in time for diagnostic purposes. In addition to the basic service, the system optionally records a movement profile, allowing for a more precise service life calculation or service planning.

superwise i.Cee: additional sensors are installed in your system, which determine the actual wear of the e-chain systems® or cables. This status information is available to you 24/7 via the i.Cee portal and enables you to plan long-term maintenance and retrofits. Depending on the i.Cee hardware in use, sensor data can be saved for later evaluation. The i.Cee systems are designed to detect unusual operating conditions at an early stage and to generate preventive information in good time!



Three smart services

superwise i.Sense

- ... displays the status in real time
- ... sensor-based display of the service life (dynamic)
- ... with sensors remote setup

superwise Basic

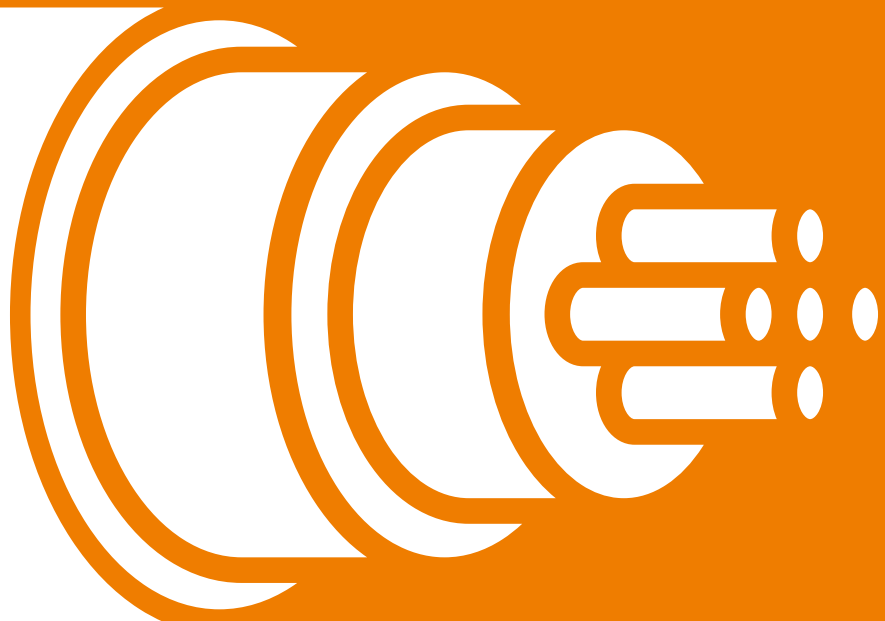
- ... includes components overview
- ... saves installation history
- ... indicates the service life (statistic-based)
- ... includes next service reminder

superwise i.Cee

- ... displays the service life (dynamic)
- ... guarantees optimised maintenance planning

Moving energy made easy ...

chainflex[®] cables



igus.eu/news-chainflex

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Online Shop
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Tech up



Cost down



Proof



Sustainability



Digital

235

Over 10 years of development in the igus® test laboratory

Sustainable machine concept with the smallest bend radii

New compact igus cables guarantee 100 million double strokes – more than any other cable in the world!

Ever smaller installation spaces, shorter and shorter cycles and 99% availability are not only the requirements for machines and facilities in the semiconductor industry. The demand for fast and compact automation systems is also increasing in many other sectors, such as medical technology, the automotive industry or in sorting plants. Therefore, we have further developed the tried-and-tested chainflex® control cables CF98 (unshielded) and CF99 (shielded). "And with great success," says Rainer Rössel, Head of the chainflex® Cables Business Unit at igus®.

"The new CF98.PLUS and CF99.PLUS cables are the first and only ones available on the market that are approved for use in the energy chain and for which igus® promises a guarantee of 100 million double strokes." This means an increase in service life of 250% compared to the original series. In addition, the new cables are designed for the smallest bend radii,

which correspond to three times the diameter of the cable (3xd). Users with an extreme lack of space can now fall back on a reliable high-end TPE cable and present a sustainable machine concept to their end customers.



Rainer Rössel
Head of Business Unit
chainflex® cables

Long service life guaranteed

For more than ten years, igus has worked on the new cables, testing them in its own 3,800 square metre laboratory and improving them. Two extra-large test rigs were set up for this purpose. The essential improvements are primarily in a special conductor material alloy and a new manufacturing process for the insulation material. The extensive testing allows igus® to promise a guaranteed service life of 36 months for all its chainflex® cables. Cable service life can also be determined online with an online service life calculator. "Users who choose CF98.PLUS or CF99.PLUS make a significant contribution to their company's sustainability concept because they are investing in their machine's durability," says Rössel.



chainflex® CFROBOT8.PLUS bus cables

For torsion up to $\pm 360^\circ/\text{m}$



igus 36-month
chainflex cable
guarantee and
service life
calculator based
on 2 billion test
cycles per year



New

Use Ethernet CAT7 safely under $\pm 360^\circ/\text{m}$ torsion

chainflex® CFROBOT8.PLUS bus cables

The unique cable series for applications with $\pm 360^\circ/\text{m}$ torsion has been expanded and now includes versions for CAN Bus and Ethernet CAT6, CAT6A and CAT7.

- ▲ Torsion angle doubled to $\pm 360^\circ/\text{m}$
- ▼ Extended service life thanks to larger torsion angle
- Test No. 4888: CFROBOT8.PLUS.045 with more than 15 million cycles. Strokes successfully tested with full data transmission
- Sustainability thanks to a longer service life is practical resource protection
- Optional with i.Sense CF.D module for smart monitoring of data transmission quality (see page 230)



New

chainflex® CF340



High-End TPE single core

chainflex® CF340 single-core motor cable

Adding a new 10mm² cross-section to the successful single-core range.

- ▲ 54% smaller bend radius compared to the four-core cable
- ▼ Save 38.58% by selecting single cores
- Tested in the chainflex® laboratory and approved by UL
- Sustainability thanks to a longer service life is practical resource protection, enhancing economic efficiency and protecting the environment
- Cable service life predictable online individually for every application:
igus.eu/chainflexlife



New

chainflex® CF38



High-end TPE for 3-core motor cables

chainflex® CF38.O.PE motor cable

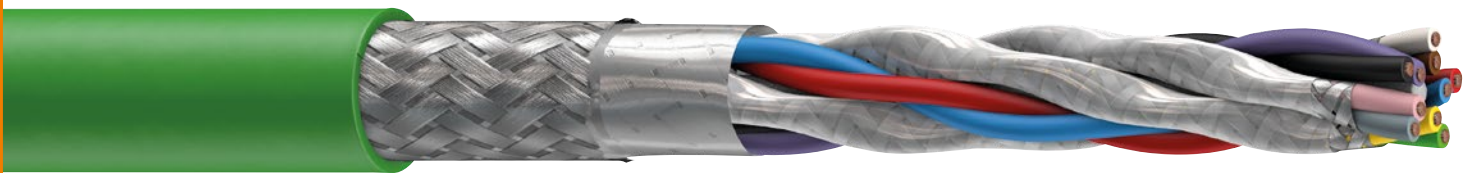
New cross sections (3x6.0)C and (3x25)C without earth cores for the CF38 high-end motor cable series.

- ▲ With high-end quality for use on long travels, at lowest temperatures and with the smallest bend radius
- ▼ Service life increased by 25% to 12.5 million guaranteed double strokes
- Test (No. 4904) CF38.250.04 successfully tested with 43 million strokes
- Sustainability thanks to a longer service life is practical resource protection, enhancing economic efficiency and protecting the environment
- Depending on the application, calculate the service life of the cable individually online:
igus.eu/chainflexlife



chainflex® CF211.030 measuring system cable

Suitable for SINAMICS V90



New

Cost-effective measuring system cable with guarantee

chainflex® CF211.030 measuring system cable

Expansion of the chainflex® measuring system cable range CF211 to the larger portfolio for dry environments. Tested and with a 36-month chainflex® guarantee.

- ▲ A wider range of drive technology suitable for Siemens
- ▼ Cost-effective cable for applications with slight oil influence
- Test No. 4901: CF211 with 53 million strokes successfully tested in a 75mm radius
- Sustainability thanks to a longer service life is practical resource protection
- 🔗 Calculate service life of the cable online:
igus.eu/chainflexlife



System suitable for Siemens SINAMICS V90

Advantages of the CF211.030 measuring system cable with PVC outer jacket

The new chainflex® CF211.030 energy chain measuring system cable has been specially developed and tested for connection to the SINAMICS V90 system. The SINAMICS V90 system presented by Siemens is typically used in the beverage and packaging as well as in the textile and solar industries.

In all of these areas of application, there is no high exposure to oils or cooling lubricants, for example. That is why the igus® solution of the chainflex® CF211.030 with a highly abrasion- and bending-resistant PVC outer jacket is exactly the right answer for all chain applications in these areas.

Advantages of PVC over PUR

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

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

Tested and guaranteed

All cables are tested in the industry's largest laboratory (3,800 m²). With UL AWM approval and UL verified and 36-month chainflex® guarantee.

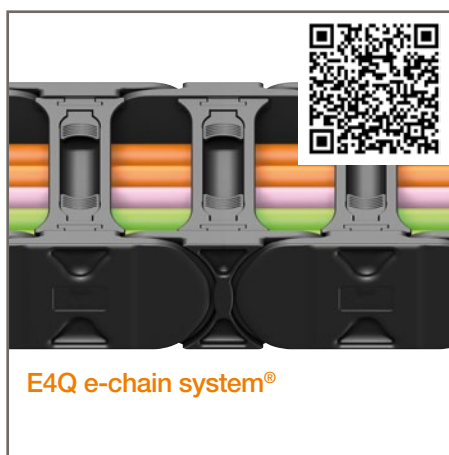
Available from stock

The cable is available from stock, without cutting charge, shipped within 36 hours and, if required, also harnessed with connectors.



Further highlights

Suitable for the Siemens V90 system



chainflex® CF220.UL.H304 hybrid cable

Suitable for SINAMICS S210



New

Siemens hybrid now also available with a PVC jacket that costs 15.3% less

chainflex® CF220.UL.H304 hybrid cable

PVC hybrid cable suitable for Siemens SINAMICS S210 drives. In addition to a cable with an oil-resistant PUR jacket, there is now also a version that costs 15.3% less for applications in dry environments.

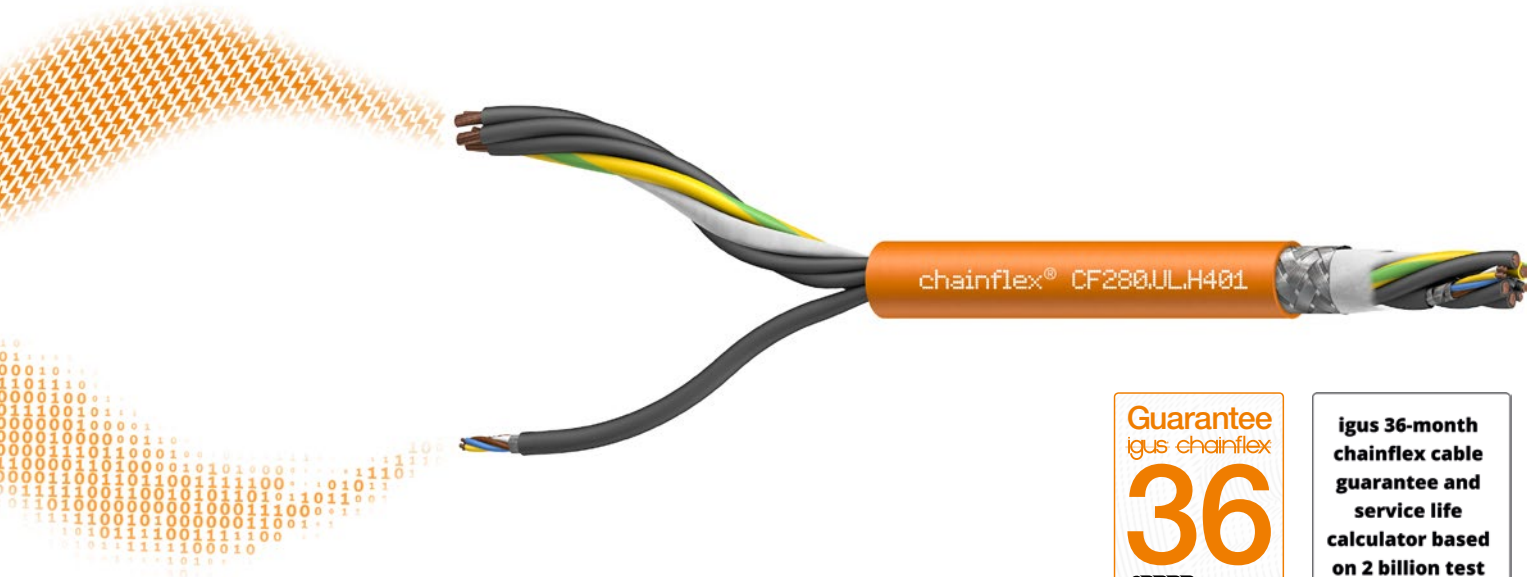
- ▲ Optimised abrasion behaviour, especially well suited to the woodworking industry and the material handling and packaging sectors
- ▼ Selecting PVC as the outer jacket material ensures a 15.3% saving
- Material development and mechanical requirements tested on basis of billions of movements in the chainflex® test laboratory

Calculate service life of the cable online:
igus.eu/chainflexlife



chainflex® CF280.UL.H401 hybrid cable

Suitable for ctrIX DRIVE



New

Servo hybrid with oil-resistant PUR jacket

chainflex® CF280.UL.H401 hybrid cable

Hybrid cable suitable for Bosch Rexroth MS2N-series drives.

- ▲ Save around 40% installation space in the chain
- ▼ Only one instead of two cables for safe data exchange between motor and frequency converter
- Test: CF280.UL.H.D with bus element with an extremely small bend radius in series application, successfully in use for over five years
- Material weight (plastic + Cu) is 43% less than that of separate servo and measuring system cables
- 🔗 Calculate service life of the cable online:
igus.eu/chainflexlife



For top drives with DNV approval



New

Additional safety for top drives

chainflex® CFSPECIAL.5xx

The new DNV approvals for the CFSPECIAL.5 series give you, the customer, a great deal of security thanks to individually coordinated test procedures and strict qualification measures harmonised with DNV, you can be sure that you are getting the best possible product.

- ▲ Special top drive cable solutions now with suitable DNV approval
- ▼ Reduce project certification costs thanks to DNV approval for the entire CFSPECIAL.5xx series
- Complete documentation of eligibility criteria and test procedures
- On-demand delivery eliminates excessive cable waste
- Detailed product documentation in the technical data sheet online



The perfect alternative to service loops

Developed and tested for use in top drives on drilling rigs

The chainflex® CFSPECIAL.5xx top drive cables, now with DNV approval, have been specially developed and tested for top drives, i.e. for applications on drilling rigs.

Protected by a robust PUR outer jacket with aramid support elements for long travel lengths and NEK 606 resistance.

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.

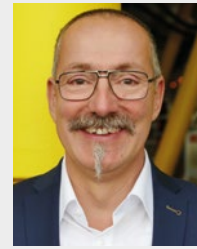
Advantages of e-loop® with CFSPECIAL.5xx

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 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



Rainer Rössel
Head of Business Unit
chainflex® cables

Further highlights

For offshore and top drive

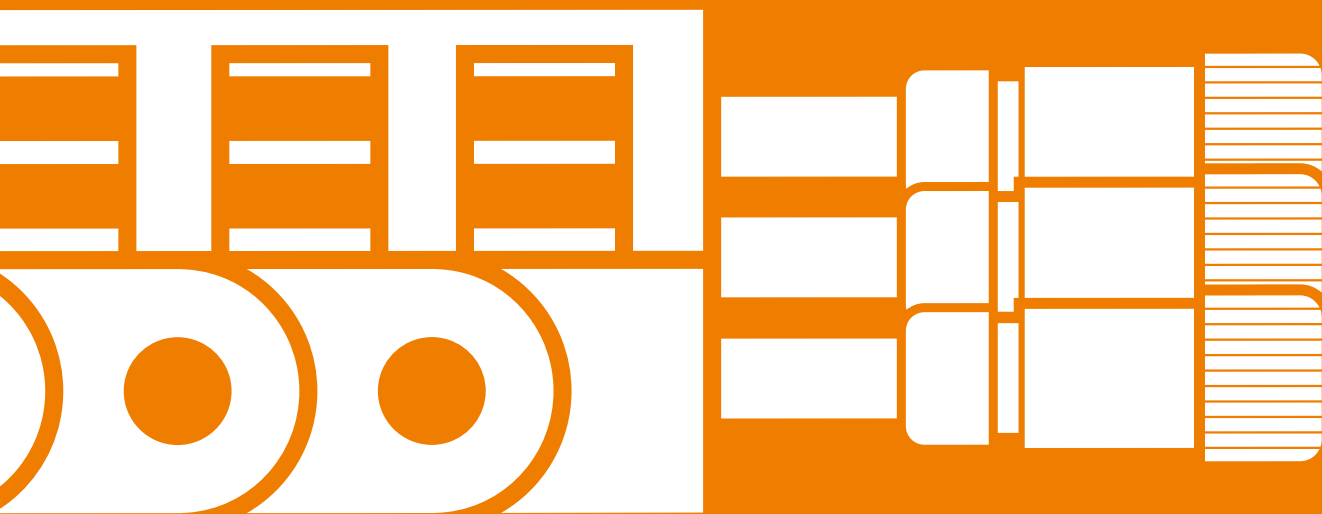


Moving energy made easy ...

readycable[®]

readychain[®]

**Ready-to-connect
solutions**



igus.eu/news-rc

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Digital

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Online shop
buy readycable® online:
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Tech up



Cost down



Proof



Sustainability

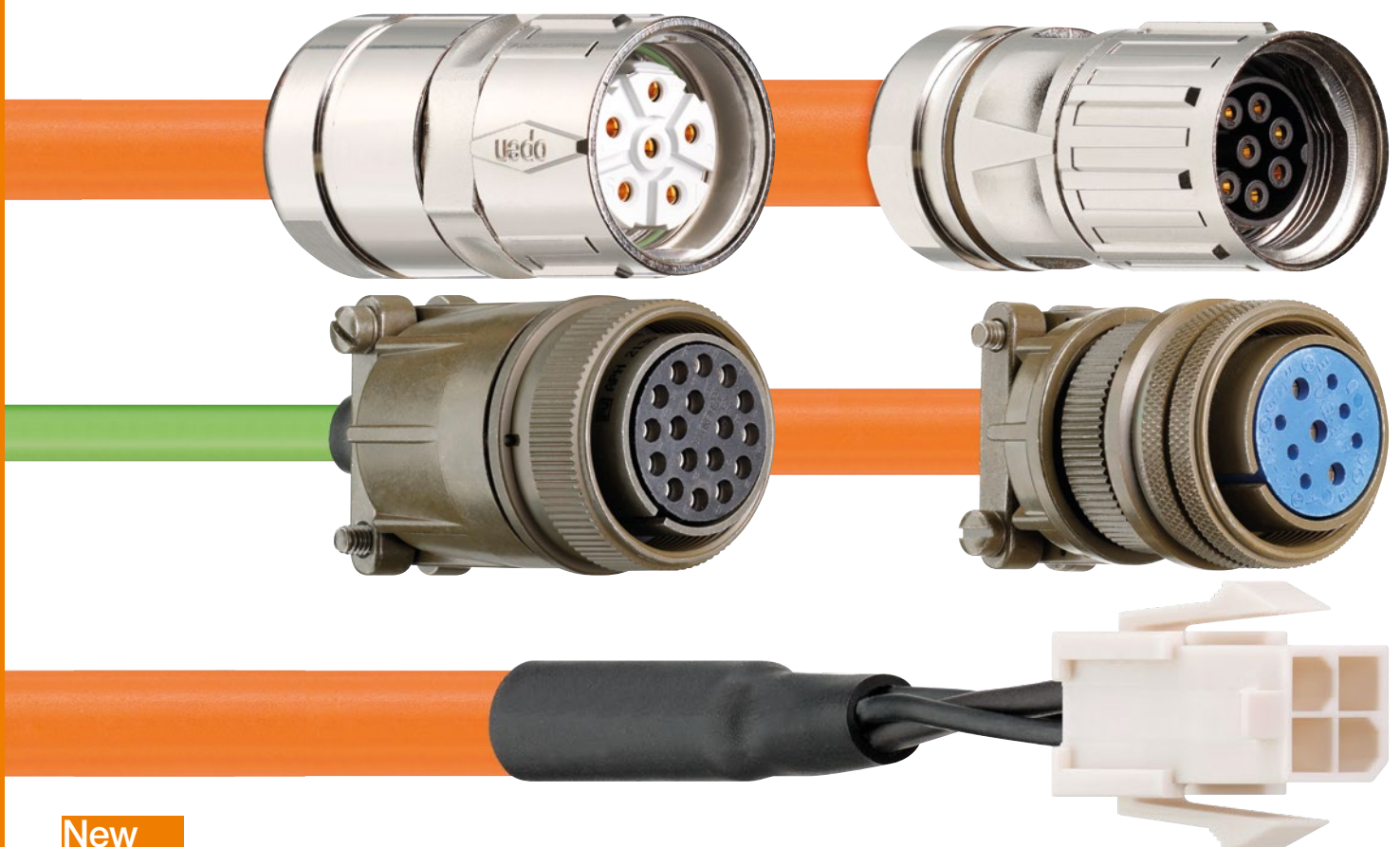


Digital

247

readycable® cables for drive technology

Plug & play: 24+6 manufacturers



New

Even bigger selection

readycable® cables for drive technology

Addition of six well-known manufacturers to the readycable® product range for drive technology: Panasonic, Harmonic Drive, Wittenstein, KEB, Delta and Hengstler. This means that harnessed and quality-checked cables suitable for 30 manufacturers are now available, delivered in 5 business days. To your required length, no minimum order quantity.

- ▲ 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% testing (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: www.igus.eu/readycable



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



Christian Stremlau
Head of the readychain® & readycable® division



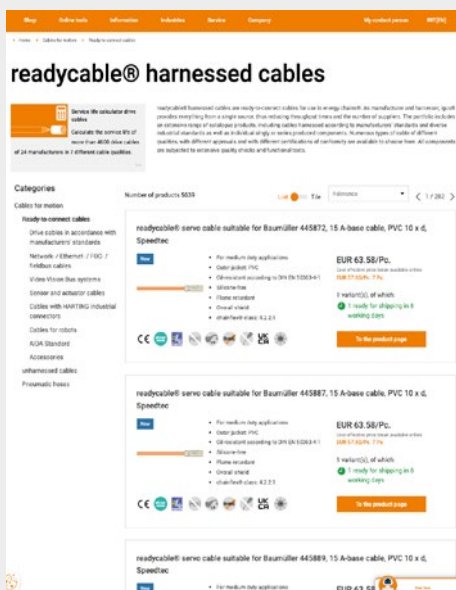
Markus Hüffel
Product Manager readychain® & readycable®

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.

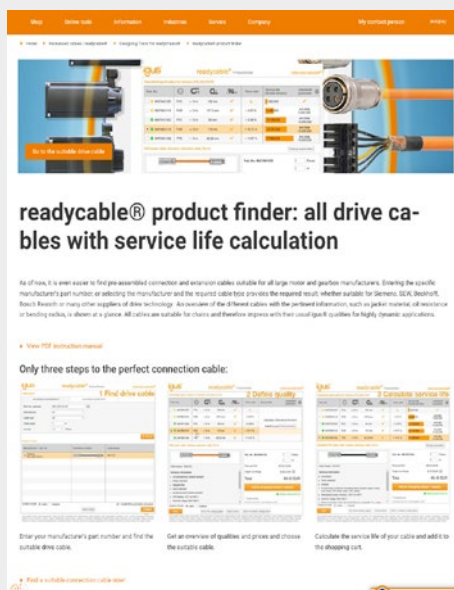
We always have over 6,000 different connector types from well-known manufacturers (TE/Intercontec, Harting, Binder, Yamaichi, to name just a few) in stock. Thanks to the close cooperation, we have found preferred suppliers to whom we have tailored both our production processes and our machinery.

"Large storage capacities 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.

readycable® online



readycable® shop
Buy harnessed cables online



readycable® finder
Find more than 5,000 drive cables and calculate service life online



EPLAN macros
Import readycable® product data directly into EPLAN via macros



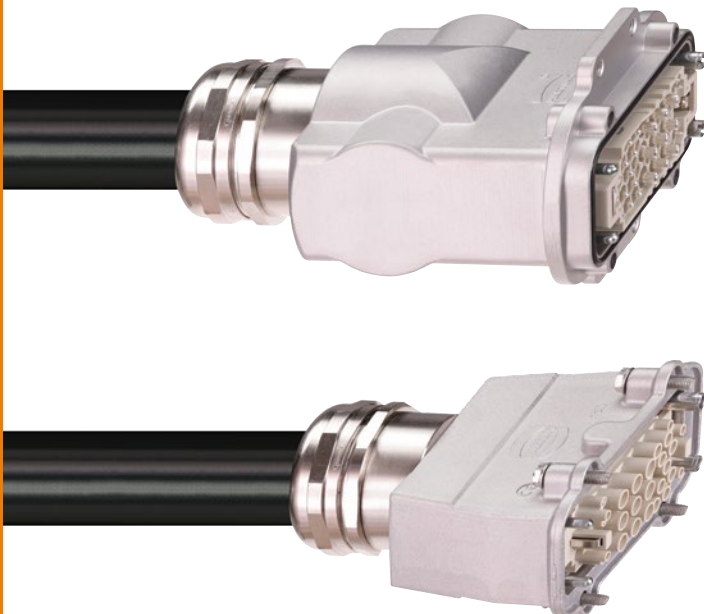
New

Suitable for B&R, Bosch Rexroth, SEW and Siemens

Drive technology product range extension

New harnessed cables suitable for B&R, Bosch Rexroth, SEW and Siemens

- ▲ 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% testing (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



New

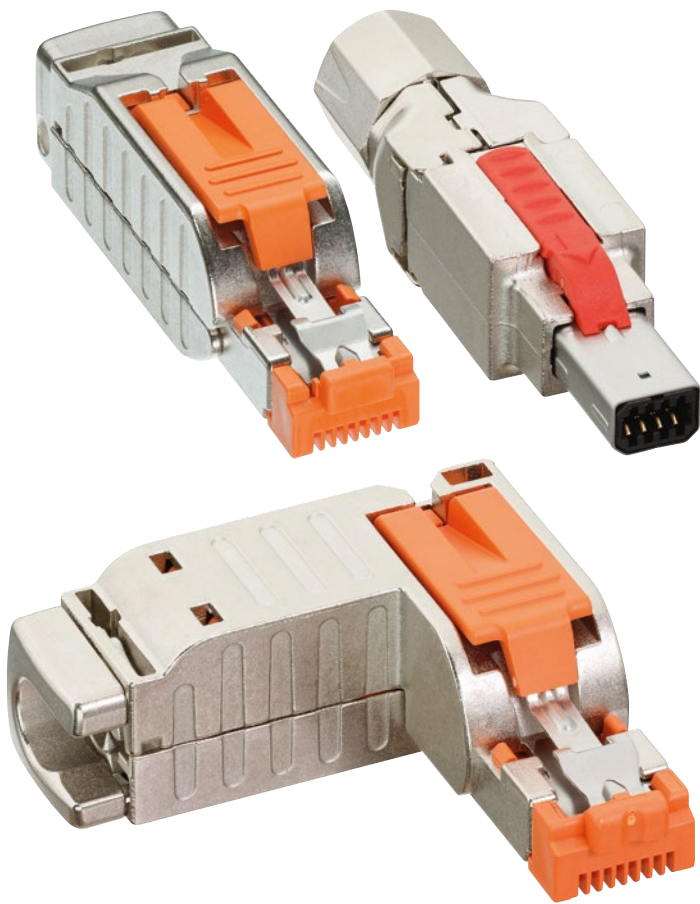
Safe robot connection

New readycable® suitable for KUKA Quantec 2

Addition to the harnessed cables suitable for KUKA robots.

- ▲ Harnessed, ready to connect and immediately ready for use
- ▼ Manufactured to the required length with centimetre accuracy, so there is no waste
- 100% testing (test seal of approval and test report)
- Long-lasting cable materials + high-quality plug-in connectors + machining = Guaranteed reliability and value retention of the components
- 🔗 Calculate the guaranteed service life of the cable online





New

High-end for network technology

New RJ45 and mini I/O plug-in connector

Six new connector types from TE Connectivity complete the igus® connector portfolio.

- ▲ High-end plug-in connectors for highest industrial requirements
- ▼ Available in 24hrs from stock for just-in-time delivery
- Robust design - developed and optimised for industrial applications
- Durable materials for sustainable use
- 🔗 All igus® connectors online: igus.eu/connectors



New #smallspace

More Single Pair Ethernet for small installation spaces

New readycable® network technology SPE

Two new harnessed single pair Ethernet cables with Weidmüller and Yamaichi connectors. For continuous industrial Ethernet communication in machines and systems with only one pair of cores for transmitting data.

- ▲ Energy chain-compatible Ethernet communication for the entire system
- ▼ Ideal solution for small installation spaces
- 100% testing (test seal of approval and test report)
- Future-proof data communication
- 🔗 Calculate the guaranteed service life of the cable online



readychain® p-rack

Carries a lot, weighs a little



„It's
corn“



New

Light printing instead of hard welding

readychain® p-rack

Lightweight, easy to handle and smooth running, yet highly resilient and with unlimited geometry options. The new readychain® p-rack is a 100% tailor-made interface solution with elements precisely manufactured using 3D printing. From batch size one.

- ▲ Ergonomically and precisely tailored to customer requirements, tool-free assembly/disassembly
- ▼ Reduced weight for cheaper shipping, additional space-saving return transport
- Assembly time reduced by 66%
- Printed from cornstarch and recyclable
- With GPS tracking (optional)



The first additive manufacture e-chain® rack

More than ten years ago, igus® offered customers individual transport and assembly solutions with the patented, modular design of the readychain® rack. This year's novelty readychain® p-rack is a very flexible and simple addition for readychain® customers so that they can benefit from the advantages of a customised solution even faster.



All attachments of the readychain® p-rack are produced from corn starch using 3D printing

Customisation, process optimisation, efficiency

The above terms are indispensable in any industrial production. What has been part of everyday life for a long time, igus® uses very successfully in industrial harnessing and when creating ready-to-connect assemblies.

With the help of additive manufacturing methods such as 3D printing, "customised" igus® transport and assembly solutions are possible for customer projects. Modules that are precisely tailored to the application offer individual solutions and thus not only save time and money in advance, for example



for the construction, but also for subsequent adjustments. This ideal installation solution pays off from batch size one. If larger quantities are involved, volume and transport costs can be saved for returns thanks to the reduced weight and the modular design.

Quick and easy assembly

The readychain® p-rack (printed rack) is a practical example of an individual and tailor-made solution: all add-on parts are printed in 3D and therefore fit the technical framework conditions or the interface of the customer with millimetre accuracy - with virtually endless possibilities in terms of geometry. Where so far complex metalworking by specialists was required, the components are now printed within 36 hours. The parts are not only manufactured much faster, they are also a lot lighter than their metal predecessors. The weight, reduced by up to 80%, saves resources and makes handling much easier and safer. The construction operates smoothly and helps reduce installation effort by up to 66%. The assembly/disassembly is carried out completely without additional hand tools.

Sustainable and robust

All add-on parts of the readychain® p-rack can be printed from corn starch, among other things. This means that almost all geometries can be realised quickly; at the same time, the material is very robust and absolutely "rustproof". The material can be completely regranulated and reused.

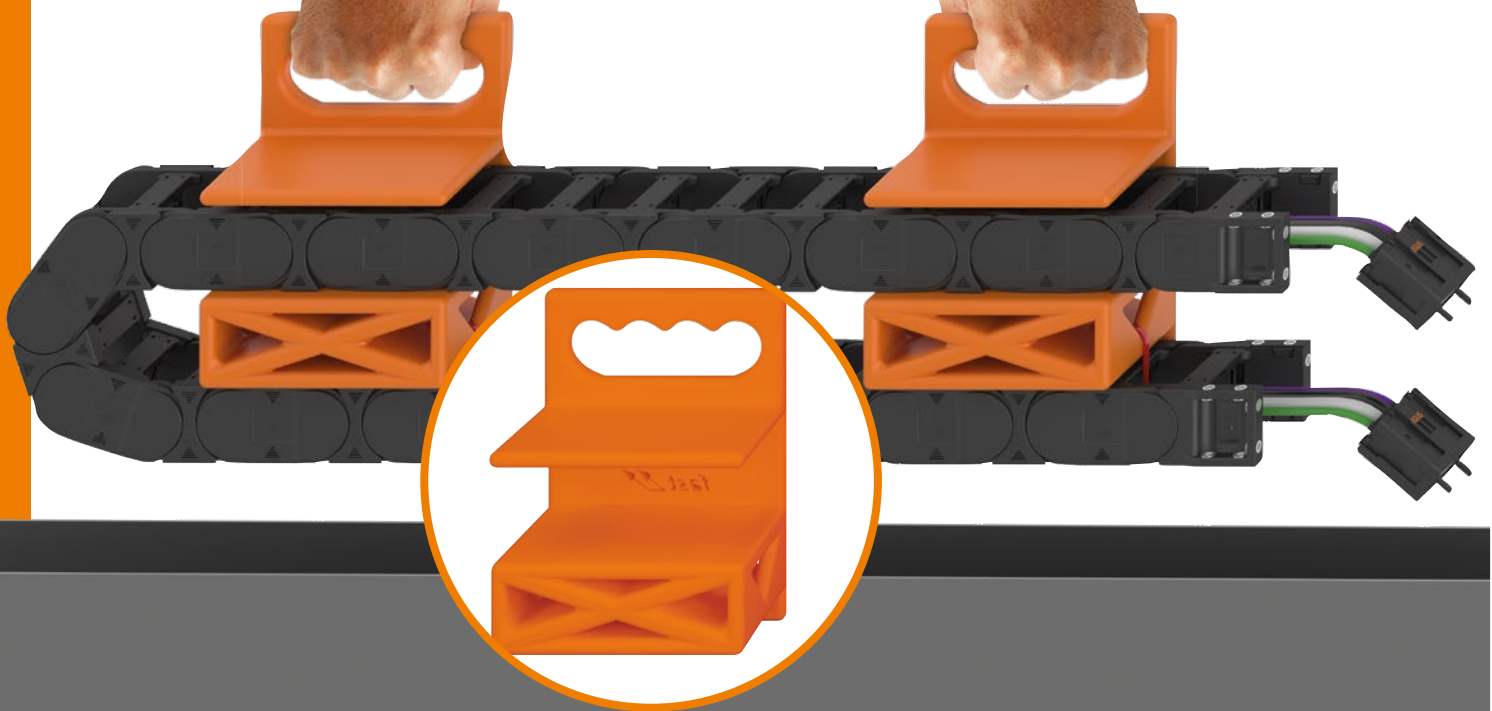


Christian Stremmlau

Head of the readychain® & readycable® division

readychain® fast positioner

Assembly made easy



New

Easy, reliable and fast positioning

readychain® fast positioner

The readychain® positioners easily bring small and medium-sized readychain® systems into the desired installation position. The parts are precisely adapted to the requirements and individually manufactured using 3D printing.

- ▲ Easy and reliable assembly of harnessed readychain® systems
- ▼ No other tools needed
- Assembly time reduced by up to 30% due to optimum installation delivery
- Printed from sustainable materials and regranulable



One connector module instead of many individual connectors

The *fast interface*

Safe and efficient.



The Module Connect is a new type of connector for connecting electrical cables, fibre-optic cables and pneumatic hoses. Due to its space-saving, flat housing, it is used wherever a large number of cables are to be plugged into the smallest possible space.

igus.eu/module-connect



Facts

The story behind igus®

„Give me your most difficult part and I will find a solution“, said Günter Blase. He had to take a risk in order to win over Pierburg Vergaser, his very first customer. There were two children at home who needed to be cared for. Money was in short supply. He had just set up igus® with his wife Margret and the first injection moulding machine still had to be bought. The order from Pierburg Vergaser was urgently needed.

And Günter Blase received that enquiry from Pierburg. The most complicated problem part was a valve cone for a carburettor. In 1964, no-one would have come up with the idea of using plastic to make this small metal component and, what's more, to do so with an injection-moulding machine. The manufacturing process was simply too complicated. For Günter Blase, this was no reason to lose heart. He went into his double garage and experimented until the first perfect plastic valve plug emerged from the injection-moulding machine.

The double garage in Cologne-Mühlheim soon became too small. Just like the new location in Bergisch Gladbach. Today, the headquarters of igus® GmbH are still in Cologne - in the district of Lind - but accommodate over 800 injection-moulding machines on an area of over 200,000m². In addition, igus® has over 30 distribution locations worldwide.

The business areas have expanded, from plastic energy chains and plain bearings to other components for moving applications and complex automation solutions. The core philosophy is still the same as it was phrased by Günter Blase in 1964.

„Give us your most difficult part and we will find a solution.“

motion plastics® ... improve what moves



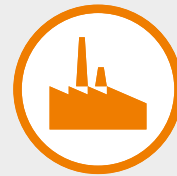
igus® facts at a glance



4,600 employees worldwide



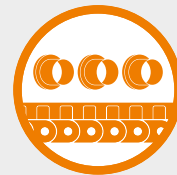
€1.115 billion turnover



31 locations + distributors
in over 80 countries



188,000 customers



243,000 parts from stock



800 injection-moulding machines

Disclaimer

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IMPS – igus® motion plastics® show

Discover all 190 new products online at the virtual-real trade show stand: exhibition.igus.eu



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