



printing.

igus® solutions for the printing industry

plastics for longer life® ... igus

industry

... [www.igus.eu/print](http://www.igus.eu/print) ...

# Reduce costs ...



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drylin® linear and  
drive technology  
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## Clean, quiet and cost-effective solutions for the printing industry in 24h.

The term "printing technology" refers to numerous methods of duplicating masters and templates. By motion plastics® igus® refers to numerous tribologically optimised plastic products which help you to reduce the costs of your equipment and increase its service life. This may be due to the lack of need for lubrication and maintenance or due to our dry-running bearing elements or due to fail-safe cables and optimum cable guidance. From our range of 100,000 modular products, we always offer the right solution whatever the purpose is and whatever the requirements are. Extremely low-vibration energy guides for very high acceleration rates, abrasion-resistant and confirmed to be in acc. with IPA DIN EN ISO Class 1, super-silent from 32 dB(A), very high data rates CAT7, 600 MHz and a cable guarantee of 36 months against failure.

## Some advantages of the igus® motion plastics® products for the printing industry:

- Lubrication- and maintenance-free
- Insensitivity to print dusting powder and paper dust
- Vibration dampening
- Quiet (32 dB(A))
- Corrosion resistant
- Also suitable for high loads and speeds
- Available from stock
- All igus® systems can be calculated in terms of their functionality and suitability
- Extremely high data rates
- Cable guarantee of 36 months\*

Our online tools also enable you to reduce process costs. igus® delivers from stock in 24-48 hours! Also, see our industry website.

 [www.igus.eu/print](http://www.igus.eu/print)

We look forward to talking to you.

# ... Improve technology ...



**System E6: extremely quiet operation, cleanroom compatible and ideal for fast movements and changes of direction. Here in a large format printer/plotter**

... with motion plastics®  
from igus®

\* 36 months or up to 10 million double strokes (5 million for cables of the chainflex® M family); whichever is first



# igus® solutions ...

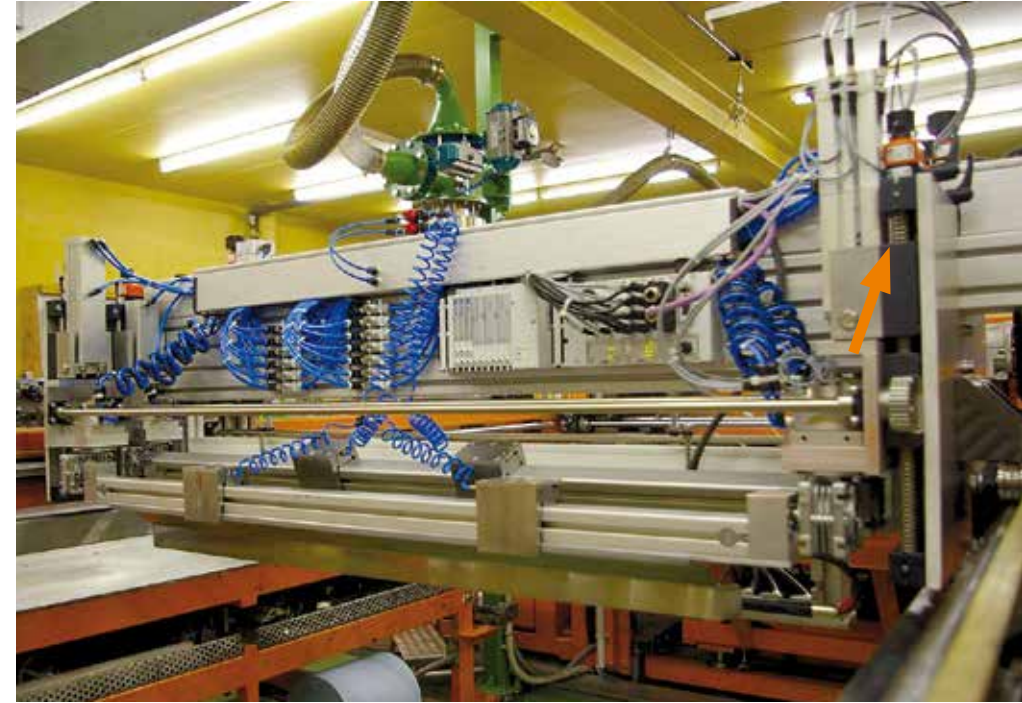
High reliability ... quiet ... low vibration ...



e-chains® and chainflex® cables suitable for clean rooms

# ... for the printing industry

... suitable for clean rooms ... very high acceleration



igus® drylin® drive technology and e-chains® in silk screen printing equipment



Large format printer with smooth-running e-chain® E6 for extreme acceleration



e-chain® and chainflex® cables in special machine construction for gravure printing



# igus® applications ...

Lubrication- and maintenance-free ... simply fit and forget ...



Hot foil stamping machine with drylin® drive technology

# ... for the printing industry

... insensitive to dirt



drylin® toothed belt axes as flat gantry in a printing system



Ltd. printing machine with drylin® T linear guide



Inkjet printer with drylin® linear guide



Engraving machine with circular-mounted igus® e-chains®

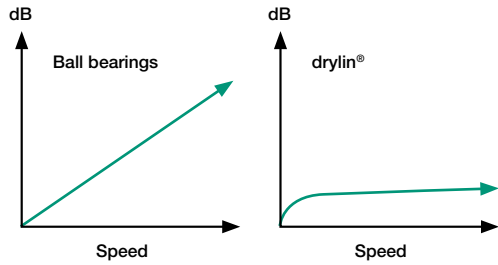


# Benefits of ...

## energy chains®, cables and linear technology ...



e-chains® noise test



Comparison of noise development

### Quiet and smooth

In many industries, the sound pressure level of machines is becoming increasingly important. The individual machine elements, including energy chains® or linear systems for example, are also selected with this in mind. The E6.1 e-chainsystem® is characterised by very high running smoothness due to the structural design, due to its small pitch and "spring connector". With 32 dB(A)\* the E6.1 system is the most quiet igus® e-chain® in the product range. The drylin® linear technology is also characterised by very low operating noise. Quiet operation is due to the difference between rolling and sliding. Operation is much quieter compared to re-circulating ball systems. The sliding motion is extremely quiet and barely any noise is audible.

\*E61.29.070.055.0 with v=1 m/s, tested in the igus® lab



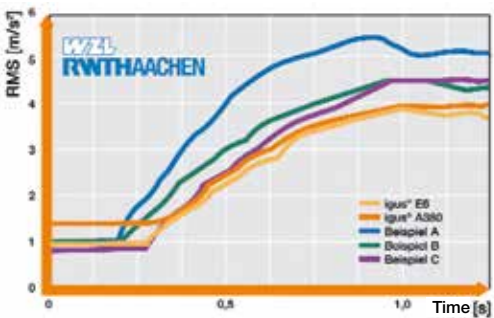
drylin® R – 1:1 interchangeable with linear ball bearings

### Low vibration and vibration dampening

The special structure of the chain links and the small pitch are the reasons for the extremely quiet and low-vibration operation of the e-chain® from the E6 product line. In a study of the Laboratory for Machine Tools and Production Engineering (WZL) at RWTH Aachen, we were able to confirm this: "The E6 energy supply system from the company igus® is characterised by extremely low vibration levels or smoothness."



igus® System E6.1 available in six inner heights (29-80 mm)



Vibration testing of energy chains®

# ... igus® motion plastics®

## ... reduce costs and improve technology

### Clean room

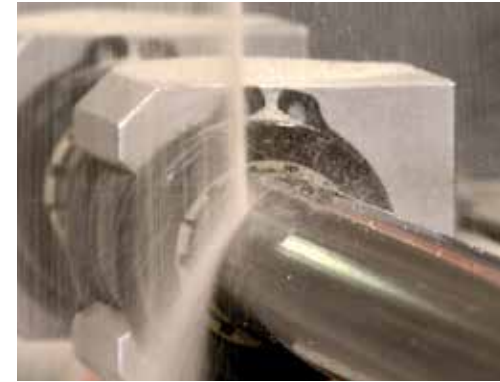
For over 15 years igus® has been one of the forerunners in energy supply systems in clean rooms. igus® offers a broad range of IPA-tested e-chains® that allows the machine-specific supply of energy in clean rooms and also an easier assembly. Since the quality requirements for cleanroom technology applications as well as those on the part of the customers and test standards are constantly growing, igus® is continuously working on improving its products.



Product	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Total
chainflex®	629	218	-	-	-	-	874
drylin®	-	-	5	-	26	166	197
e-chains®	1,170	4,062	993	-	2,822	-	9,047
<b>Total</b>	<b>1,799</b>	<b>4,280</b>	<b>998</b>	<b>-</b>	<b>2,848</b>	<b>166</b>	<b>10,091</b>

### Resistant to dirt

Use is also possible in very dirty and dusty environments. Particles are repelled from the contact surface by the movement itself. Seals can be dispensed with due to the dry operation. No oil for dirt and dust to stick to.



### Lubrication-free dry operation

drylin® linear bearing systems are designed for running dry. Your applications are thus protected against contamination through grease and oils. Even for use in a very dirty environment where a lot of paper dust occurs. Particles are repelled from the contact surface by the movement itself. Here the front of the slides works like a wiper. The contact surface remains clean.





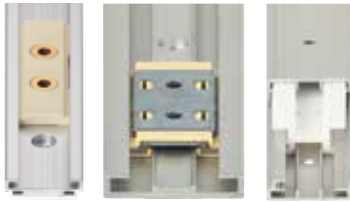
# Quiet linear travel ...

## Lubrication-free and maintenance-free drylin® linear technology ...

drylin® is a product range of lubrication-free linear plain bearings based on the principle of sliding instead of rolling. Tribologically optimised iglidur® high performance polymers are used as sliding surfaces. The drylin® linear systems run dry and are maintenance-free. Linear guide systems with rails or round shafts are available. The drylin® drive technology can supply ready-to-connect systems with lead screw drives or toothed belt drives, with or without motor. The focus is on the ruggedness and insensitivity to influences such as dirt, water, chemicals, heat or impacts, as well as the freedom from maintenance and lubrication

- Insensitive to dirt due to dry operation
- Quiet operation
- Vibration dampening
- Resistant to impacts and vibration
- Dirt channels for paper dust.
- High static load capacity
- Cleanroom compatible
- Lightweight
- Suited for short-stroke applications
- Available from stock
- Special designs according to your specifications e.g. curved rail profiles

### A choice from over 2,000 drylin® products:



#### drylin® N low profile guides

- Low installation height 6-12 mm
- Very lightweight
- Numerous carriage options – also with pretension

[www.igus.eu/drylinN](http://www.igus.eu/drylinN)



#### drylin® W linear linear system

- Modular structure, low weight
- Square rail with floating bearing function for 90 degree installation

[www.igus.eu/drylinW](http://www.igus.eu/drylinW)



#### drylin® T linear guides

- Automatic clearance adjustment
- High static load capacity
- High levels of dirt resistance
- Low vibration and quiet

[www.igus.eu/drylinT](http://www.igus.eu/drylinT)



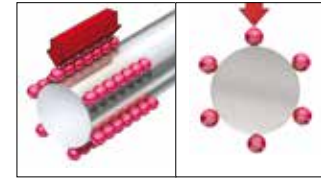
#### drylin® R shaft guides

- Dimension is identical to standard commercial bushings
- Shafts, shaft support blocks and accessories available from stock, replaceable liners

[www.igus.eu/drylinR](http://www.igus.eu/drylinR)

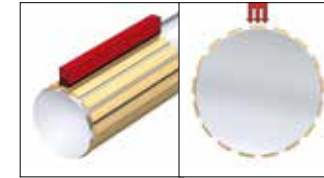
# ... quiet ... maintenance-free

## ... sliding instead of rolling ... resistant to dirt



#### "Conventional" rolling bearings – point contact

Force is transmitted via balls at certain points. The system requires lubrication to ensure proper functionality.



#### drylin® plain bearings – surface contact

The force is transmitted two-dimensionally over liners or sliding elements. The system is lubrication- and maintenance-free over the entire service life.



#### Resistant to dirt, dust and moisture –

due to lubrication-free use and dirt channels, for example, paper dust cannot stick.

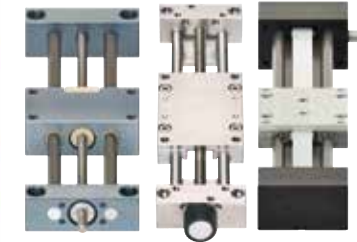
### Further solutions from the drylin® modular kit:



#### drylin® lead screw drives

- Efficient and durable dryspin® technology
- Self-locking trapezoidal and metric threads
- Lead screw nuts made from 5 iglidur® materials

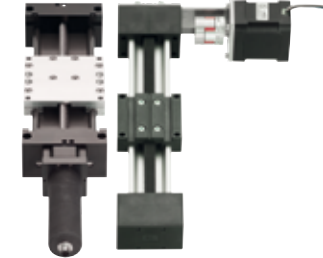
[www.igus.eu/drylin-leadscrewdrives](http://www.igus.eu/drylin-leadscrewdrives)



#### drylin® drive technology

- Linear modules with lead screw drive or toothed belt
- For manual or electrical adjustments
- Configuration with customised stroke lengths

[www.igus.eu/drylin-drive](http://www.igus.eu/drylin-drive)



#### drylin® E drive technology

- Linear axes with stepper motors/ DC motors
- Fail-safe due to the use of encoders and initiators
- Can be combined for gantry configurations

[www.igus.eu/drylinE](http://www.igus.eu/drylinE)

Explore more products at [www.igus.eu/drylin](http://www.igus.eu/drylin)

# Lubrication-free mounting ...

## Plain bearings made of high-performance polymers – iglidur®

No lubrication or maintenance required, while cutting costs and increasing service life, everything from stock and delivered promptly – that is the central idea of all igus® products. iglidur® plastics have been extensively tested with respect to wear and friction values including other relevant material properties. iglidur® polymer plain bearings from igus® signifies the step from the plastic bearing to the tested and therefore predictable machine component.

- Absolutely lubrication-free
- Vibration dampening
- Maintenance-free
- High static loads
- Light weight
- No corrosion
- Metric and imperial dimensions
- Available from stock
- Special dimensions and designs on request

One choice out of over 50 iglidur® materials:



### igidur® G polymer plain bearings

- High abrasion resistance
- Resistance to dust and dirt
- CDP-suitable

[www.igus.eu/g](http://www.igus.eu/g)



### igidur® J polymer plain bearings

- Vibration dampening
- Low moisture absorption
- Excellent sliding partner even for "soft" shafts

[www.igus.eu/j](http://www.igus.eu/j)



### igidur® X polymer plain bearings

- For operating temperatures from -100 °C to +250 °C in continuous operation
- Low moisture absorption
- Extremely wear resistant in the entire temperature range

[www.igus.eu/x](http://www.igus.eu/x)



### igidur® J200 plastic plain bearing

- Very long service life with hard anodised aluminium
- Low coefficients of friction
- Low wear
- For low to medium loads

[www.igus.eu/J200](http://www.igus.eu/J200)

Explore more products at [www.igus.eu/igidur](http://www.igus.eu/igidur)

# ... self-aligning ...

## Lubrication-free and maintenance-free spherical bearings – igubal®

igubal® is a system of self-aligning bearing elements made completely from plastic. The igubal® series provides developers with a complete system of self-adjusting bearing elements: rod end bearings, clevis joints, flange bearings, spherical bearings and pillow block bearings. Self-aligning bearings are easy to fit, adapt to all angular deviations and replace special housings in many cases. igubal® utilises all the advantages of the high-performance plastics employed. They can be used in dry operation and have excellent vibration dampening properties. They are resistant to dirt, can operate in liquids and even in chemicals and are completely resistant to corrosion.

- Excellent damping properties
- Resistant to chemicals and corrosion
- High frequency possible
- Predictable service life
- Maintenance-free igubal® spherical bearings with diameters from 2 to 50 mm

One choice from virtually over 2,500 igubal® products:



### Various types of pillow block bearings

- With split housing and/or spherical ball (optional)



### Flange pillow block

- With 2 or 4 mounting holes
- Also available as HT version for up to +200°C



### Rod ends

- With male/female thread; right/left
- Also available as HT version for up to +200°C



### Clevis joints and spring-loaded fixing clip

- Individually or in combination (e.g. with clevis joints)



### Spherical bearings and self-aligning clip bearings



### Double joints and coupling bars

Explore more products at [www.igus.eu/igubal](http://www.igus.eu/igubal)

# Polymer ball bearings from ... .. the dry-tech® construction kit

## Ball bearings made of high performance plastics – xiros®

xiros® polymer ball bearings revolutionise the ball bearing market. Where conventional metallic ball bearings are not expedient, many applications can be successfully implemented by their maintenance-free dry operation and the use of xirodur® high-performance polymers.

- Lubrication- and maintenance-free
- High corrosion resistance
- For temperatures up to +150 °C
- High media resistance, washable, non-magnetic
- Low weight



### xiros® polymer ball bearings

Are available in different materials, with good chemical resistance, long service life, high temperatures and high speeds.



### xiros® axial bearings

For absorbing axial forces. The xirodur® B180 ball bearing material is extremely media-resistant yet, at the same time, low priced. Temperature resistant up to +80 °C.



### xiros® flange bearing

Flange ball bearings and other designs with stainless steel balls were developed for maintenance-free use in conveyor belts, cam rollers and guide rollers.



### Tube with flange ball bearings

The complete solution combines lightweight, anodised aluminium tubes with maintenance-free and cost effective flanged ball bearings from xirodur® B180.



### xiros® combination with igubal®

Combination of xiros® polymer ball bearings and igubal® housings for the maintenance-free use in conveyor belts, cam rollers and guide rollers.



### Other designs

More lubrication-free and maintenance-free polymer ball bearings for many applications where conventional ball bearings made of metal are not effective.

## ... special parts, liners and bar stock



### Special parts made from tribo-plastics according to customer requirement

speedimold is simple! Constructive special solutions just as you need it, virtually everything is possible. iglidur® offers you self-lubricating and maintenance-free plain bearing solutions, all according to your wishes, "off the shelf" or "custom made", especially for your applications: Choose from 8 iglidur® tribo-plastic materials iglidur® G, iglidur® J, iglidur® W300, iglidur® X, iglidur® M250, iglidur® P, iglidur® A180, iglidur® H2 and igumid G. You will get, depending on the complexity of parts, injection-moulded parts in 1 to 10 days with no minimum order value.

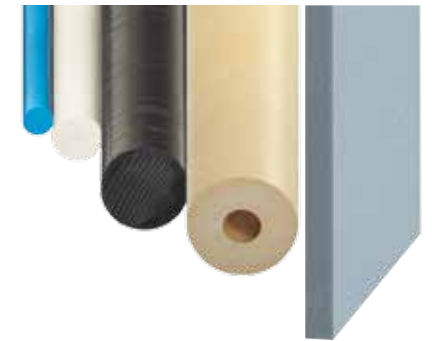
[www.igus.eu/speedimold](http://www.igus.eu/speedimold)



### Easy to cut and glue – Tribo-Tape

- Suitable for a variety of lining for tribologically stressed surfaces and shapes
- Easy to cut and glue
- Less space required
- Optional self-adhesive back

[www.igus.eu/tribotape](http://www.igus.eu/tribotape)



### For free design – iglidur® bar stock

- iglidur® materials as round bars, tubes and plates
- Currently 25 iglidur® materials to choose from
- Cut to required size without offcut removal
- Mechanical processing from a batch size of 1
- Maintenance-free and calculable

[www.igus.eu/barstock](http://www.igus.eu/barstock)

Explore more products at [www.igus.eu/xiros](http://www.igus.eu/xiros)

Explore more products at [www.igus.eu](http://www.igus.eu)



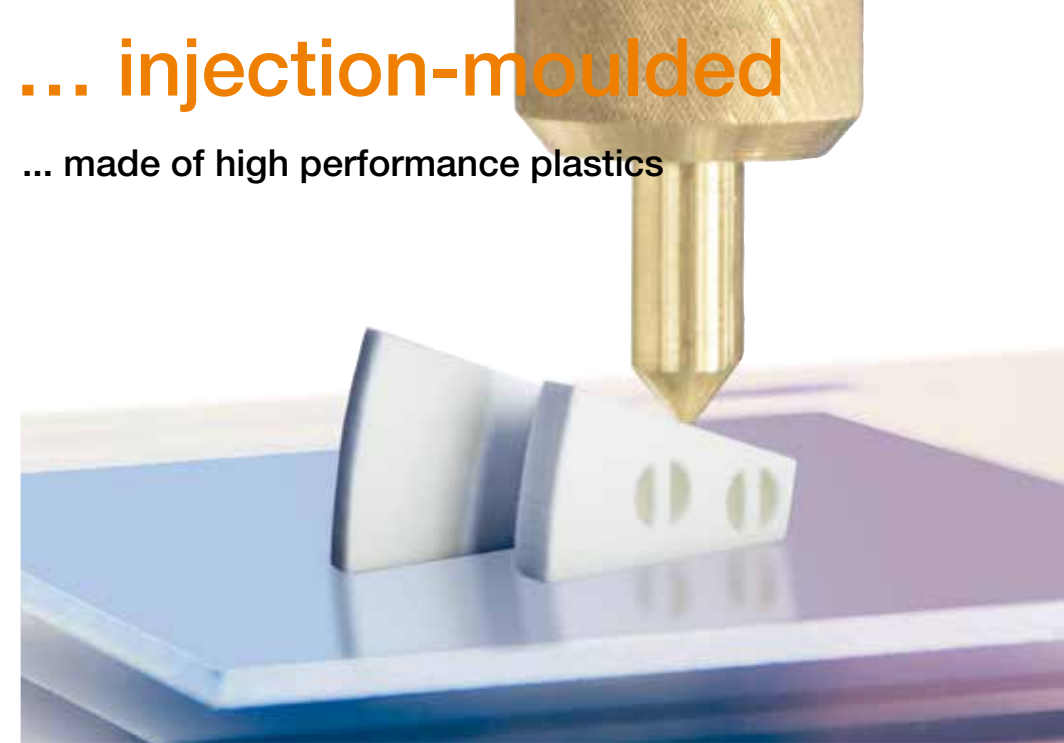
# Printed as good as ...

3D printing for wear-resistant parts ...



# ... injection-moulded

... made of high performance plastics



## Wear-resistant plastic parts from the 3D printer

iglidur® Tribo-Filaments are the only 3D printing materials specially developed for moving applications. The printed parts can be used directly in the moving application and convince their users due to the typical Tribo characteristics – they are lubrication-free and extremely wear-resistant. The degree of wear is up to 50 times lower than that of other 3D printing materials.

You can easily print your desired parts yourself with the filament or order the desired parts quickly and easily online through our 3D printing service.

For the even more precise, selective laser sintering method, igus® supplies a Tribo-Powder with an abrasion-resistance that is at least 3 times better than conventional materials. From June, also available for the 3D printing service.

**Tested service life. Available immediately with online lifetime calculators.**

## Wear resistant parts with the 3D printing service



We print your individual component, using lubrication-free, abrasion-resistant iglidur® plastics; easy to order and quick to install: everything you need from prototypes to complex special parts.



Upload your 3D file, check the 360° view and the units of measurement, and select a Tribo-Filament. Depending on the complexity of your product, we will then deliver it in as little as 24 hours.

Find more information at [www.igus.eu/tribo-printing](http://www.igus.eu/tribo-printing)

Explore the printing service at [www.igus.eu/3dprintservice](http://www.igus.eu/3dprintservice)

# robolink® – for building ...

Joint kit  
for robots ...

robolink®  
components

Mechanical  
robot arms

Electro-mechanical  
robotic arms

Individual  
control system

For robot makers,  
mechanical engineers,  
etc.

For mechanical engineers,  
automation suppliers, etc.

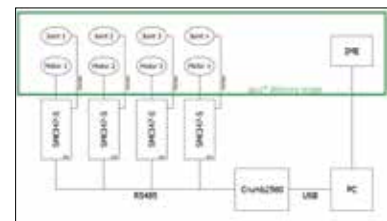
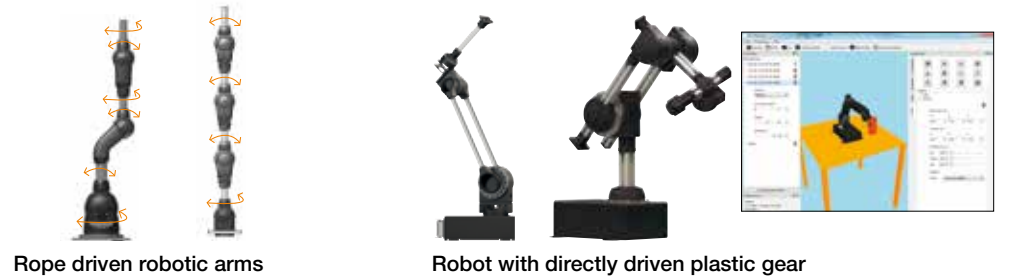
For automation suppliers,  
integrators, mechanical  
engineers, etc.

Control system by you

Explore more products at [www.igus.eu/robolink](http://www.igus.eu/robolink)

# ... robots at a low cost

... light ... compact ... free





# Moving energy made easy

## Solutions from the igus® e-chains® construction kit

### e-chains® – designed to guide and protect.

e-chainsystems® are the "umbilical cord" of modern machines. They reduce downtime and increase the service lives of cables and hoses. Plastic energy chains® have been developed, produced and tested by igus® since 1971. e-chainsystems® carry sensitive bus, data and fiber optic cables, as well as energy forms such as electricity, gas, air and hydraulics.

- Maintenance-free – no grease or oil needed to lubricate the joints
- Modular design reduces the assembly time
- Cleanroom compatible, Class 1 or 2
- Very quiet, from 32 dB(A)
- For extreme speeds and accelerations 784 m/s<sup>2</sup>
- Electrically insulating
- The plastic material reduces noise development and has a vibration dampening effect
- Easy to adjust the length
- Resistant to dirt, sea water, chemicals, extreme temperature
- Diverse modular interior separations
- Lightweight AND high stability

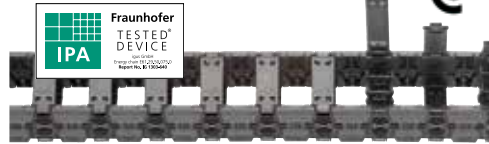
### One choice from 90,000 e-chains® products:



#### e-skin®

- Unique corrugated tube, easy to mount
- Built-in rigidity for unsupported lengths
- Dust- and water-proof

[www.igus.eu/e-skin](http://www.igus.eu/e-skin)



#### System E6.1

- Extreme dynamics, stable, light and quiet
- For all installation positions, quickly fillable
- Cleanroom Class 1 and 32 dB(A)

[www.igus.eu/E6-1](http://www.igus.eu/E6-1)



#### System E2/000

- energy chains® of medium sizes (21 to 45 mm inner height)
- Snap open on left and right
- Diverse modular interior separations

[www.igus.eu/E2000](http://www.igus.eu/E2000)



#### System E4.1

- For virtually all applications
- Inner heights from 21 to 80 mm
- e-chain® and tubes snap-open along two sides
- Quick installation, cable-friendly design

[www.igus.eu/E4-1](http://www.igus.eu/E4-1)

Explore more products at [www.igus.eu/e-ketten](http://www.igus.eu/e-ketten)

# chainflex® works – guaranteed

## chainflex® cable types from stock, with guarantee

### 25 years of chainflex® – cables with the special structure for a very long service life in energy chains® and the unique 36-month guarantee\*.

Flexible cables in energy chains® need a special design to last through many cycles, high speeds and accelerations, as well as demanding environmental conditions. Electromagnetic compatibility and compliance with standards and guidelines such as NFPA 79, UL, CSA, VDE, Inter- and Profibus are also taken for granted today. The igus® chainflex® product range extends from energy chain® compatible control cables, servo cables, motor cables, as well as robot cables to bus cables, data cables, encoder cables and fibre optic cables.

- Temperature range from -40 °C to +90 °C
- For highly dynamic applications in energy chains®
- Special design prevents cable failure and "corkscrewing"
- Cleanroom compatible, ISO Class 1 or 2
- 36 month guarantee for chainflex® cables\*



### One choice from 1,244 chainflex® types:



#### Shielded TPE control cable CF10

- For heavy duty applications
- Resistant to oils and organic oils
- Hydrolysis- and microbe-resistant

[www.igus.eu/CF10](http://www.igus.eu/CF10)



#### Clean air pneumatic hose

- TPE outer jacket
- Metal-free and oil-resistant
- PVC- and halogen-free, UV-resistant

[www.igus.eu/cape](http://www.igus.eu/cape)



#### Shielded TPE data cable CF240.PUR

- For heavy duty applications
- Oil- and coolant-resistant
- PVC- and halogen-free
- Flame-retardant

[www.igus.eu/CF10](http://www.igus.eu/CF10)



#### PVC fibre optic cable CFLG88

- For flexing applications
- PVC outer jacket
- Maximum EMC protection
- Preferably indoor applications

[www.igus.eu/CFLG88](http://www.igus.eu/CFLG88)

Explore more products at [www.igus.eu/chainflex](http://www.igus.eu/chainflex)

\* 36 months or up to 10 million double strokes (5 million for cables of the chainflex® M family); whichever is first

# As assembled system ...

readychain®: chain – cable – guarantee ...



## readychain® – fully harnessed systems in 3-10 days

1,600 systems produced per week in 12 readychain® factories around the world – assembly time optimised to increase your cash-flow. The largest factory for harnessed readychain® systems with 4,700 m<sup>2</sup> and 160 employees in Cologne.

- Eliminate storage costs for cables, e-chains® and connectors
- Cut turnaround times by half
- Flexibility when orders vary
- Reduce the number of suppliers and orders by 75%
- Minimise your machine downtime
- System guarantee – depending on the application

 [www.readychain.eu](http://www.readychain.eu)

Pre-assembled igus® readychain® systems:  
individual or serial production

# ... delivered ready to install

... delivered in 3–10 days



## readychain® assembly rack

80% savings during prototyping. Assembly transport rack for ready-to-install energy supply systems.

## readycable®: harnessed drive cables ... in 24-48h



## readycable® – in 24-48h or today

igus® provides more than 4,000 harnessed cables for drives according to 24 different manufacturer standards. Professionally produced, 100% tested.

- Servo, power and signal/encoder cables
- No cutting charges, no surcharges for small quantities and packaging

- Cable length accurate to the centimetre as per customer specifications
- Smallest bend radii from 7.5 x d
- Reduce storage costs and increase cashflow

 [www.readycable.eu](http://www.readycable.eu)



# Tested! Service life ...

Tested in the 2,750 m<sup>2</sup> chain and cable laboratory in Cologne. 4,100 tests, 7,512 results in the electronic database, 10 billion e-chain® cycles per year



Better products for less – a key element is the industry's largest test lab. 2,750 m<sup>2</sup> lab, more than 15,000 tests and 2 billion test strokes per year

## The igus® lab and field experience

Cutting costs while also guaranteeing maximum process reliability – only those who conduct intensive research and testing will successfully bridge this gap. The industry's largest test lab conducts more than two billion test cycles per year on a total of 107 test rigs. Our mechanical engineering components are ready for the real world because they have already passed these tests before leaving the igus® warehouse.

 [www.igus.eu/test](http://www.igus.eu/test)



Tribological testing in the plain bearing lab, igus® Cologne

# ... predicted accurately

Tested, tested, tested ... For example:



Chemical resistance to lubricating oil, motor oil, transmission oil, hydraulic oil, fuel, coolants, saline solutions, battery acids, etc.



Wear tests under the influence of different media



Load tests



Dirt resistance



Many types with fire class UL94-V2 or V0



# igus® services ...



Visit our industry web pages for more information, products, application examples and useful online-tools.

[www.igus.eu/print](http://www.igus.eu/print)



**Quickly find and configure products and calculate service life – all online.**

Using our online product finders, you can find the right igus® product and get a service life prediction.

[www.igus.eu/online](http://www.igus.eu/online)

## **i** For any task – in any batch size

Different industries need different solutions. Whether in mechanical engineering, automotive-manufacturing or in the robot industry – igus® offers customised support for specialised applications. igus® already has many years of experience and specialised resources in many industries.

[www.igus.eu/industry](http://www.igus.eu/industry)

# ... quick and reliable



The igus® delivery service  
Over 97% availability of all catalogue parts – no need for you to stock

- Over 100,000 products from stock
- No minimum order
- No surcharges for small quantities
- No costs for cutting cables
- No packaging costs

[www.igus.eu/24](http://www.igus.eu/24)



## Modern injection moulding technology

The igus® GmbH quality policy is based on the objective of identifying and meeting customer needs, and of always being a professional partner and reliable supplier. igus® has always been committed to producing products of the best possible quality and consistently developing innovative solutions.



## The igus® lab

The industry's largest test lab (2,750m<sup>2</sup>) conducts more than two billion test cycles per year on a total of 107 test rigs.

- Extensive test databases
- Customised tests on request

[www.igus.eu/test](http://www.igus.eu/test)

## **i** igus® motion plastics®

One vision has been driving us since 1964 – motion plastics®: Moving parts made of plastic that cost less and last longer. Our core technology consists of tribo-polymers – high-performance plastics, which we have optimised for friction and wear. The technology has made us into a world-wide leader for developing and manufacturing energy supply systems and plain bearings.





# /9001:2008 /16949:2009

igus® is certified in accordance with ISO 9001:2008 and ISO/TS 16949:2009 in the field of energy supply systems, cables and harnessing, as well as plastic bearings.

# /newsletter

Free of charge! Discover more about the latest trends and innovations from the world of igus® motion plastics®. Many exciting applications and videos for your industry.

Register here: [www.igus.eu/newsletter](http://www.igus.eu/newsletter)

# /contact

Your contact person for your industry and your country: [www.igus.eu/contact](http://www.igus.eu/contact)

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