

solar

Solutions for the solar industry
UV-resistant, lubrication and maintenance-free



• plastics for longer life®

igus®.eu...

www.igus.eu/solar



UV-resistant, lubrication and maintenance-free ... motion plastics® in the solar industry

Your technical innovator and cost reducer,
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The requirements placed on plain and spherical bearings for systems that are used to obtain energy from sunlight are very varied. Extreme temperatures and weathering by wind, water, dirt and dust push metallic bearings to their very limits.

The **dry-tech®** bearing technology from igus® can be used even in extreme surroundings and under high loads. The polymer bearings need no lubrication of any kind and contribute towards a longer service life for all types of equipment, while simultaneously lowering costs and environmental pollution.

Benefits of igus® products in solar technology:

- 25 years guarantee on igus® products made of igumid G in outdoor applications*
- UV-resistant, lubrication and maintenance-free
- Low noise operation without any torque fluctuations
- Extremely low coefficients of friction due to tribo-optimised plastics
- For confined installation spaces and where there is very little room for movement
- Failsafe cables with 36-month guarantee**
- Tested quality
- More than 17 years experience in the solar sector

In the **igus® modular system** offering more than 100,000 products from stock, you will be able to find the best solution for your application. Injection moulding and mass production guarantee a cost-effective solution for all motion plastics® applications, from rugged energy supply systems and flexible cables to lubrication and maintenance-free plain bearings. Our online tools also enable you to reduce process costs. igus® delivers from stock in 24-48 hours!



*Please ask for further details

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

igus® motion plastics®: Plastics that drive and move

It all started with an idea. When Günter Blase founded the company in his Cologne garage in 1964, igus® consisted of no more than a small injection moulding machine and the belief in the future of the material "plastic".

Tribologically optimised polymers, according to the basic igus® vision, was the key to solving the "eternal" problems of moving applications. The traditional "solution", the lubrication with oils or greases, has negative consequences, such as high maintenance, environmental pollution and machine failure. The Tribo-optimised (friction-optimised) high-performance plastics offered by igus® in the form of lubrication-free and cost-effective motion plastics® components help to solve this problem. There are 3,180 employees working in 35 countries for the implementation of the motion plastics® idea of manufacturing machine components from plastic, which creates a tangible technological and economic added value and thus a competitive advantage for more than 200,000 igus® customers worldwide.

The igus® solar system with the customer at the centre.

The company igus® receives its most important impulses from the customer. The drive was therefore always to provide each customer with the best individual solution, which at the same time increases the service life and reduces costs.

No limits for plastics for longer life®

Constant development of the products, also thanks to the impulses of our customers, have led to the development of ever new customer circles and applications. The second generation of the family-owned company has therefore become a globally leading producer of energy chain systems and polymer plain bearings. Altogether, their positive material properties, in particular their wear and abrasion resistance, significantly reduce maintenance and downtime.

Research in the igus® laboratory for better products and guaranteed service life

igus® operates the largest research and test laboratory in the industry on an area of 2,750 square metres. By conducting research in new materials and continually improving the products, today, for instance, more than 50 different iglidur® materials are offered every year with different material properties for demanding applications and more than a hundred new products and extensions. The igus® R & D investments (clearly above the average in mechanical engineering with a research rate of 5% of sales per year) serve the double purpose of achieving and maintaining the highest quality in the process, as well as providing the customer with a durable, process-safe machine part.



The 1965 idea:
"Show me the plastic part that gives you problem. I'll provide you with a solution!"



Conversion of festoon to energy chain system at MVA Weisweiler. It has been running "round" 24/7 for more than six years.



igus® research and test laboratory on a floor area of 2,750 square metres.



Change from ball bushings to drylin® linear bearings. With igus® drylin®, the machine has now been operating completely trouble-free for many years under the toughest conditions.

www.igus.eu/solar

Lubrication-free bearings made of tribo-plastics for solar energy systems

25 years guarantee on igus® products made of igumid G*

In general, all products made of igumid are characterised by a long service life and permanent resistance to corrosion, even when exposed to the weather.

Why should you prefer igus® plastics to other plastics?

Continuous exposure to UV radiation, changing temperature cycles (day/night), frequent moisture level changes (absorption/drying), fatigue due to continuous mechanical stress etc. are factors that weaken and damage the plastic, change it structurally and alter its mechanical and tribological properties.

igus® has proven the guaranteed robustness and reliability of its technical plastics empirically. The modules that have been installed in a plant in Xiamen in the south of China and are exposed to the sun and the tropical climate of the region stand out due to their retained functionality and a mere 5% decrease in the modulus of elasticity, even after more than 15 years.

Tests involving direct exposure to sunlight show a slight decrease in robustness and a reduction of moisture absorption in the first 6 months. After this and for a period of up to 10 years, no significant changes in robustness are detectable.

This experience is based on real tests and allows us to guarantee a service life of up to 25 years for our components.**

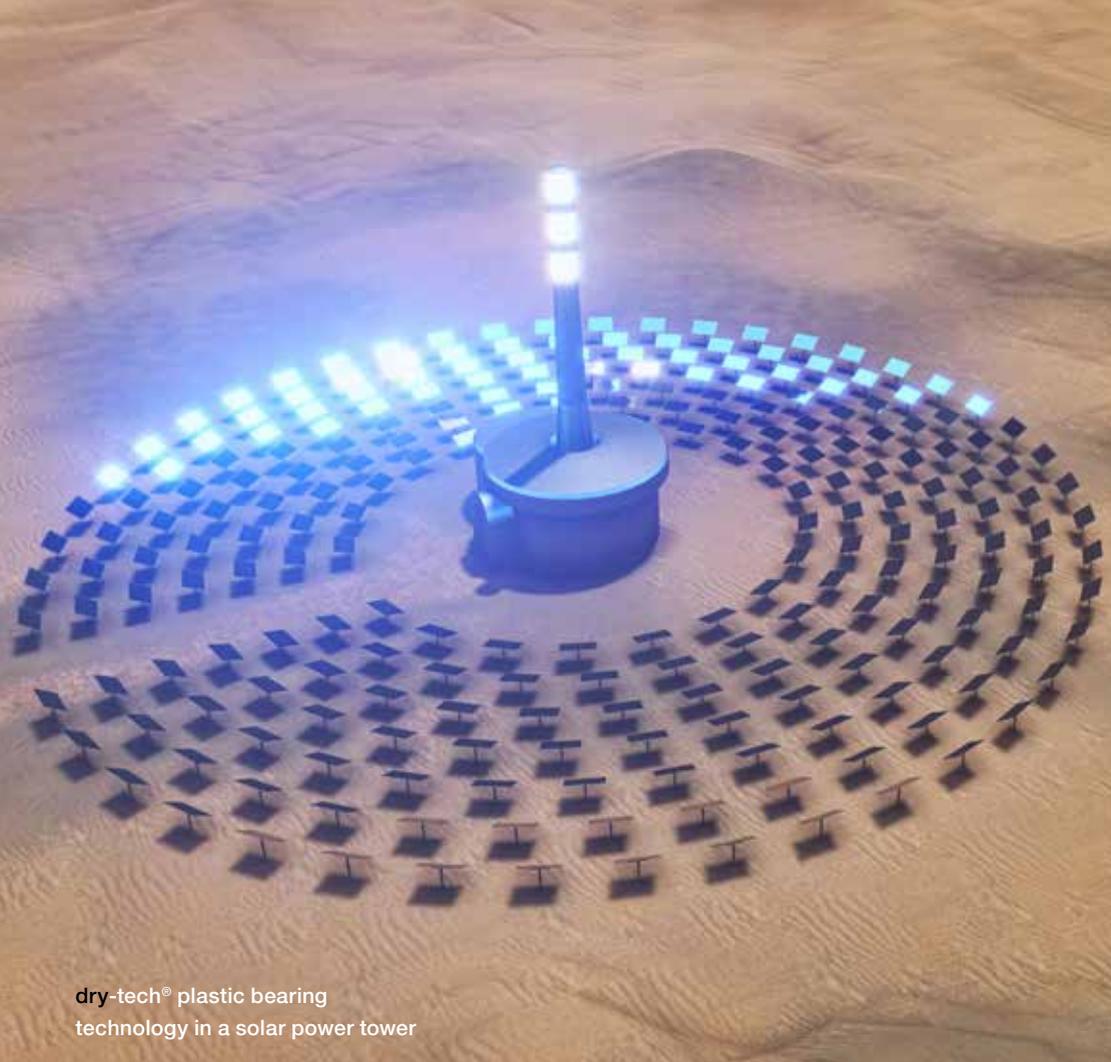
For example: www.igus.eu/KSTM-GT



* Please ask for further details ** Tied to preceding tests relating to static and dynamic loads

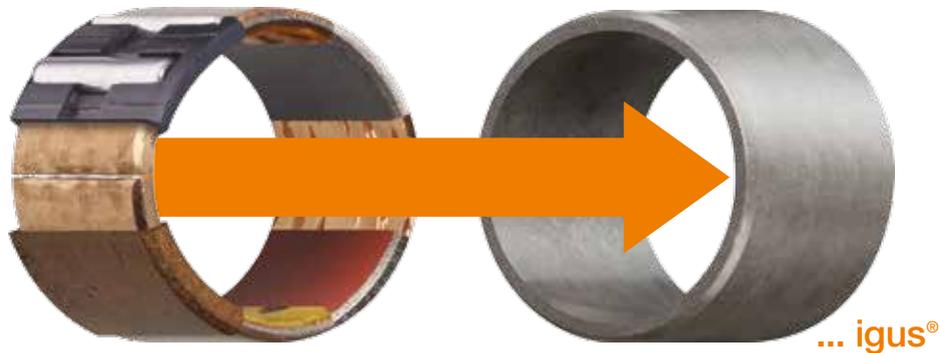


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dry-tech® plastic bearing
technology in a solar power tower

Plastic
instead of metal –
Increase service
life and reduce
costs by 40%



... igus®

Change your bearings now! Plastic instead of metal: Reduce maintenance by 100%, weight by 80%, cost by 40% while increasing the service life.

iglidur® plastic bearings are lubrication-free, maintenance-free, cost-effective and versatile. iglidur® bearings are a technically and economically beneficial alternative to metal bearings of all kinds. We also offer bearing solutions in accordance with your specific wishes – "off the shelf" or "made to measure". You can quickly check online whether a changeover to plastic is possible for your particular application. Tested service life. Available immediately with online service life calculators.

www.igus.eu/iglidur



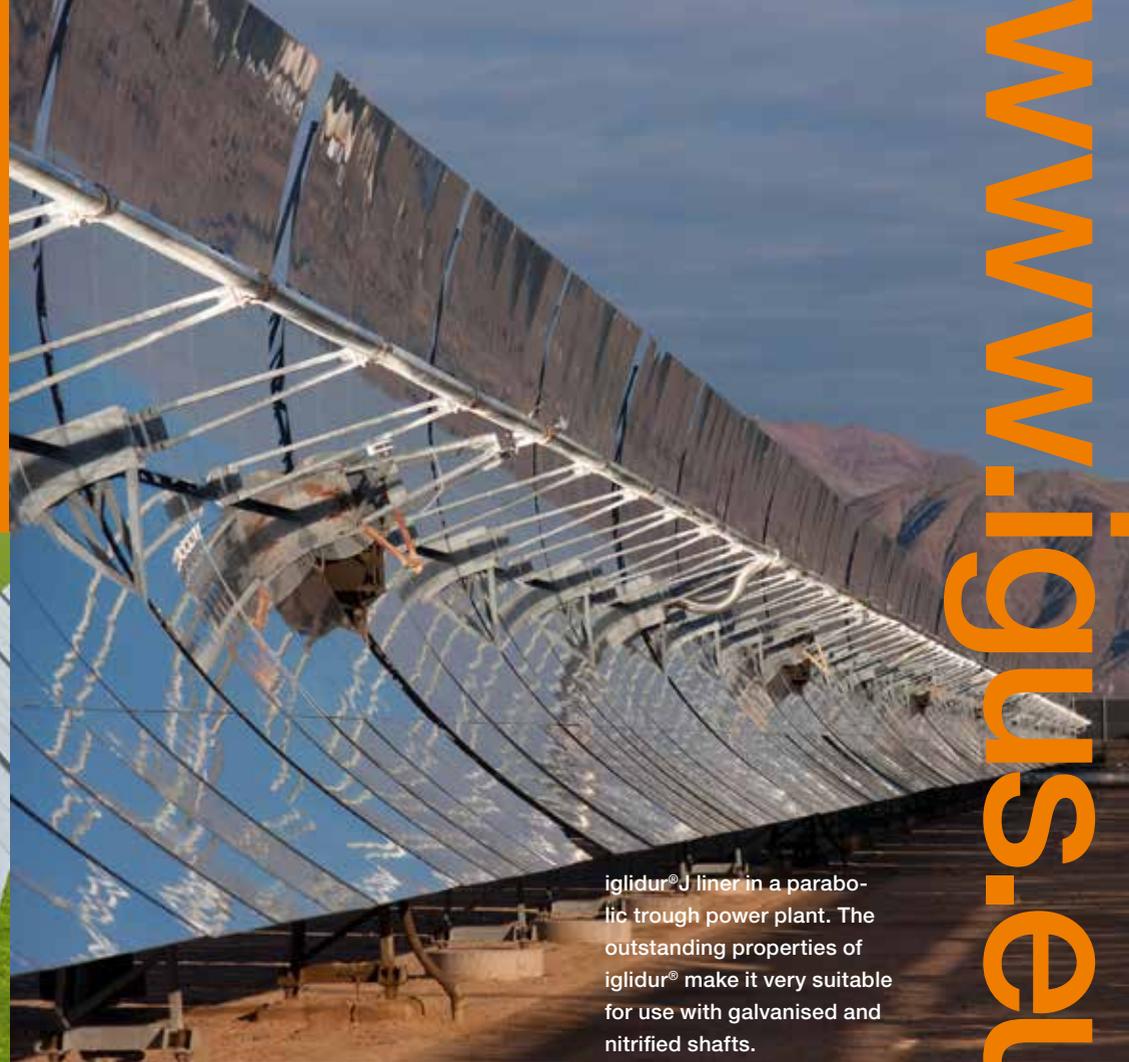
www.igus.eu/solar



Extremely low coefficients of friction thanks to tribo-plastics



iglidur® in a single-axis solar tracker



iglidur®J liner in a parabolic trough power plant. The outstanding properties of iglidur® make it very suitable for use with galvanised and nitrified shafts.



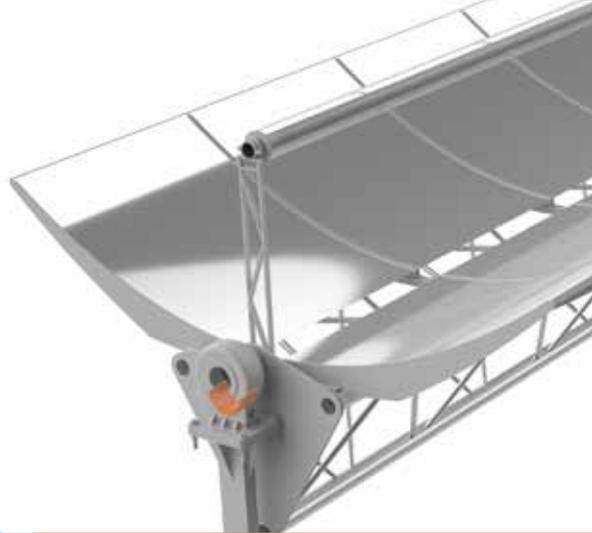
Plastic instead of metal – tested!



▲ iglidur® G on St52 gas-nitrified



▲ DU bushing on St52 gas-nitrified
www.igus.eu/shaft_test

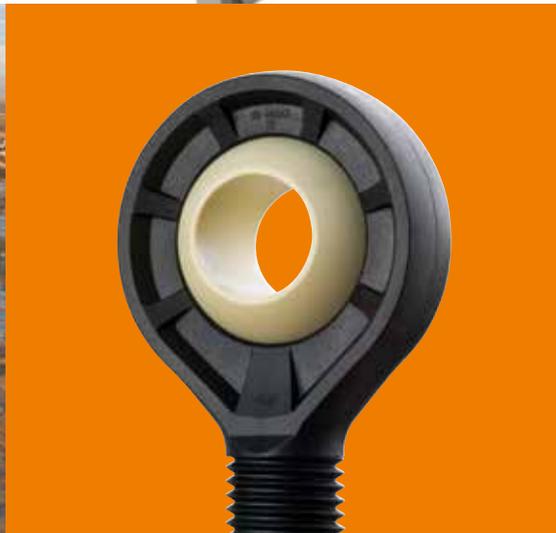


Customised: Sliding shells made of iglidur® J

- Excellent properties for use with galvanised and nitrified shafts
- Highly resistant to wear on (nearly) all shafts with very low coefficients of friction
- Vibration dampening



www.igus.eu/J



Customised: igubal® KARM-22-S1

- Resistant to dirt due to dry operation
- Resistant to impact and vibration
- High static load capacity



www.igus.eu/KARM



Extremely flexible: igubal® KGLM

- Compensation of misalignment errors
- Compensation of edge loads
- High vibration-dampening



www.igus.eu/KGLM

www.igus.eu/solar

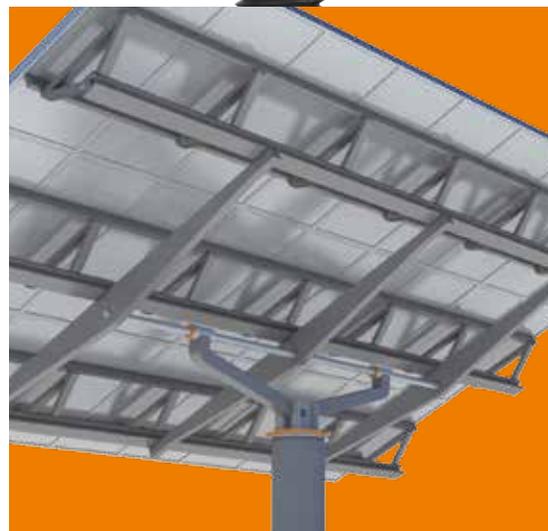
Excellent damping properties: igubal® KARM

- Resistant to impact and vibration
- Resistant to dirt
- High vibration-dampening



Maintenance-free slewing ring bearings: iglidur® PRT

- Highly rigid slewing ring
- Easy installation
- Replaceable sliding elements made of iglidur® J



Special custom solutions: speedigus®

- Special component for rotary motions
- Around 70 per cent less cost than standard metal bearings
- Lubrication-free, low weight and easy assembly



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Extremely high precision and long service life: e.g. dryspin® motor lead screws

- Ready to install lead screw motors with more efficient dryspin® technology
- dryspin® motorised lead screws with double pin from stock
- Lubrication-free dryspin® lead screw nuts in 5 materials

 www.igus.eu/dryspin

Vibration-free operation: e.g. drylin® trapezoidal lead screw nuts

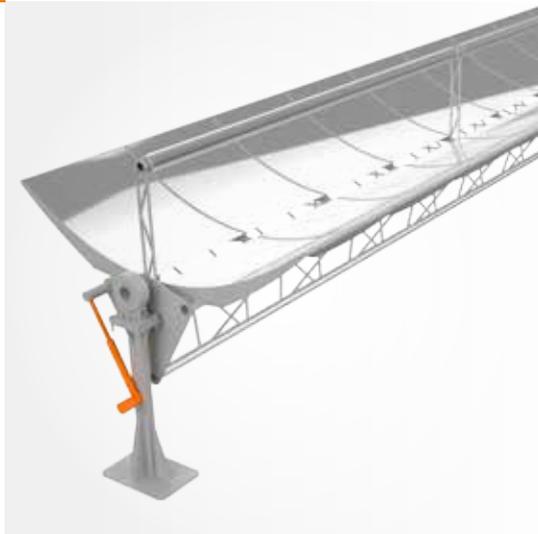
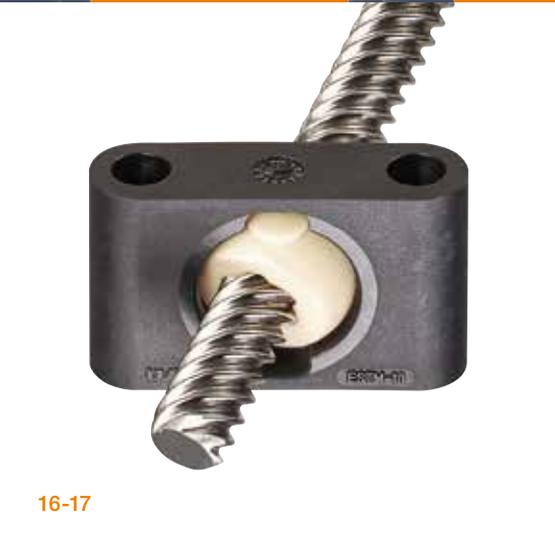
- Dry operation
- Resistant to dirt
- Different shapes

 www.igus.eu/dryspin

Compensation of tolerances: e.g. drylin® spherical lead screw nuts with pillow block bearing housing

- Reduction of radial loads
- Can conveniently be attached from above
- Continuous angle adjustment

 www.igus.eu/drylinSD



Self-lubricating and wear-resistant: iglidur® G

- Extremely long service life
- Lightweight and maintenance-free
- Quiet, vibration-free operation



www.igus.eu/G

For rotary motions: Multi-Rotation Module system (MRM)

- Several individual systems are stacked on each other
- Rotary motion possible up to 900 degrees and more
- Ideal for circular and rotary motions



www.igus.eu/mrm

Tested and with guarantee: igubal® pillow block bearing KSTM-GT

- Fitting is easy and does not require shaft removal
- Maintenance-free, dry operation
- High stiffness and durability



www.igus.eu/KSTM-GT





Energy supply for 3D applications: triflex® R

- Defined torsion stop dog and minimum bend radius
- Easy to lengthen and shorten
- Matching torsion-resistant chainflex® cables

 www.igus.eu/triflexR



Permanently UV-resistant: iglidur® J in the open-air roof

- Extremely long service life
- Lightweight and maintenance-free
- Quiet, vibration-free operation

 www.igus.eu/J



Use in a maintenance robot for solar installations: xiros® ball bearings

- Lubrication and maintenance-free
- Corrosion resistant
- Lightweight

 www.igus.eu/xiros

Lasts and lasts and lasts iglidur® bearings in the long-term UV test

- Almost all igus® products are suitable for outdoor use
- iglidur® bearings can be exposed to permanent weathering



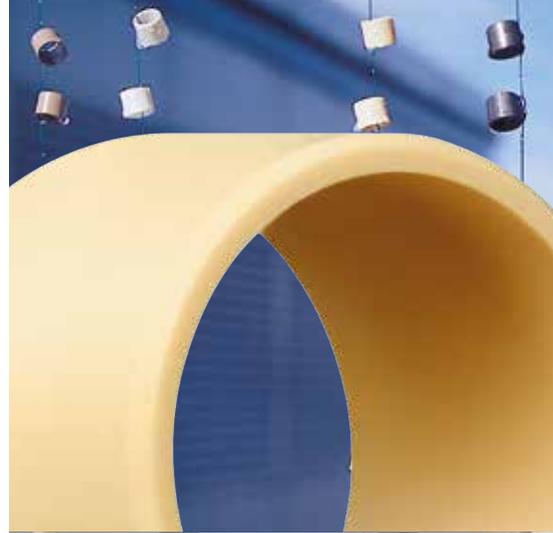
Lasts for ever: igus® e-chain® after 15 years in the sun

- Use of igus® plastics outdoors exposed to permanent weathering possible
- In direct sunlight, at high temperatures
- When it is extremely cold or under water



igus® laboratory test with continuous operation: 70-year simulation

- Continuous swivel test with a load of 1.5 metric tons
- No noteworthy wear after simulated 72 years



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Assembly



- Service for fast, error-free installation
- Specialised assembly personnel

www.igus.eu/assembly

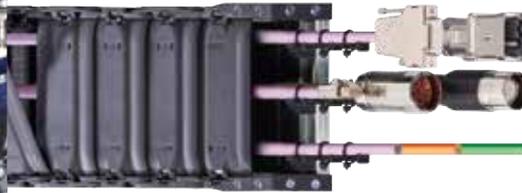
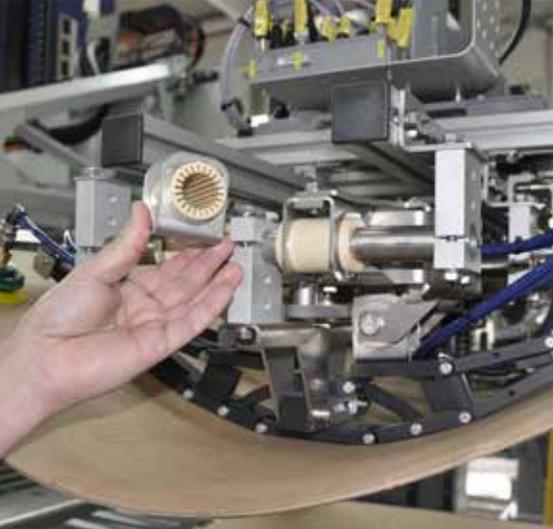


Ready to install and industrially harnessed: www.igus.eu/readychain

Always the right harness for your application Ready-to-assemble readychain® e-chainsystem® configured and delivered in 3-8 days.

Possible due to the large selection of energy chains for all kinds of motion, cables for the e-chain® with 36 months guarantee plus the relevant connectors. Reduce the number of suppliers and orders by 75%. Minimise machine downtime. System guarantee – depending on the application.

Sampling



- We provide support in the construction phase of your machine.

www.igus.eu/sampling

Basic
e-chain® with fitted cables - strain relief in the system

Standard
e-chain® with cables and relevant connectors

Standard+
Pre-harnessed e-chainsystems® with appropriate sheet-metal parts

Premium
Ready-to-install complete system with transport rack

Engineering



- Customised products
- Many solutions from the "modular kit"

www.igus.eu/engineering



The type of harnessing most frequently used in the solar industry: **Standard**
e-chain® with cables and relevant connectors

www.igus.eu/RCstandard



www.igus.eu/solar



Tested ...



- Long service life in dirty environments and in sunlight
- More than 76 million strokes in e-chain® tested
- With a bend factor of 9.4 x d



Extensive test database

Tested ...



- Cable test in the climate chamber
- Tested in motion in energy chain down to -40°C
- More than 250 tests conducted in parallel in 58 test facilities



Tested ...



- Constant load test
- Tests of wear and coefficient of friction
- Test of functioning, service life, strength and failure scenarios



Tested ...



- twisterband and chainflex® cables
- Test for torsion and twisting
- Rotate up to 7000°



From more than 15,000 tests per year was created, what is probably the world's largest test database. This database gives us the ability to select always the right product for your specific application. Individual tests for your branch of industry are also possible.

www.igus.eu/test

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

Quickly find and configure products and calculate service life – all online. With the help of our product finders, you can quickly find the right article and obtain an exact prediction of service life. All online tools also enable you to reduce process costs. igus® delivers from stock in 24-48 hours!

The screenshot shows the igus website interface. At the top, there is a navigation bar with 'Products', 'Industry Solutions', 'Service', and 'Company'. Below this, a search bar and a 'Shopping Cart' icon are visible. The main content area features a headline: 'Lubrication-free plain bearings made of triboplastics for the solar technology'. Below the headline, there is a video player with a play button and a thumbnail image of solar panels. To the right of the video, there is a text box with a warning: 'Due to a current peak in orders, our delivery times have increased temporarily to 6-12 working days for...'. Below this, there is a 'YOU COULD' section with contact information for Thomas Pfeiffer, a phone number, and a 'Your Requirements?' section with a list of options like 'myigus' and 'myCaring'. At the bottom of the page, there is a footer with 'More than 100,000 products available! Delivery and consultation: Mon-Fri 9am-5pm and Sat 9am-12pm' and a list of links: 'Newsletter Registration', 'Terms and Conditions', 'sitemap', and 'General Information'.

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Always the right solution
for the solar industry.

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.