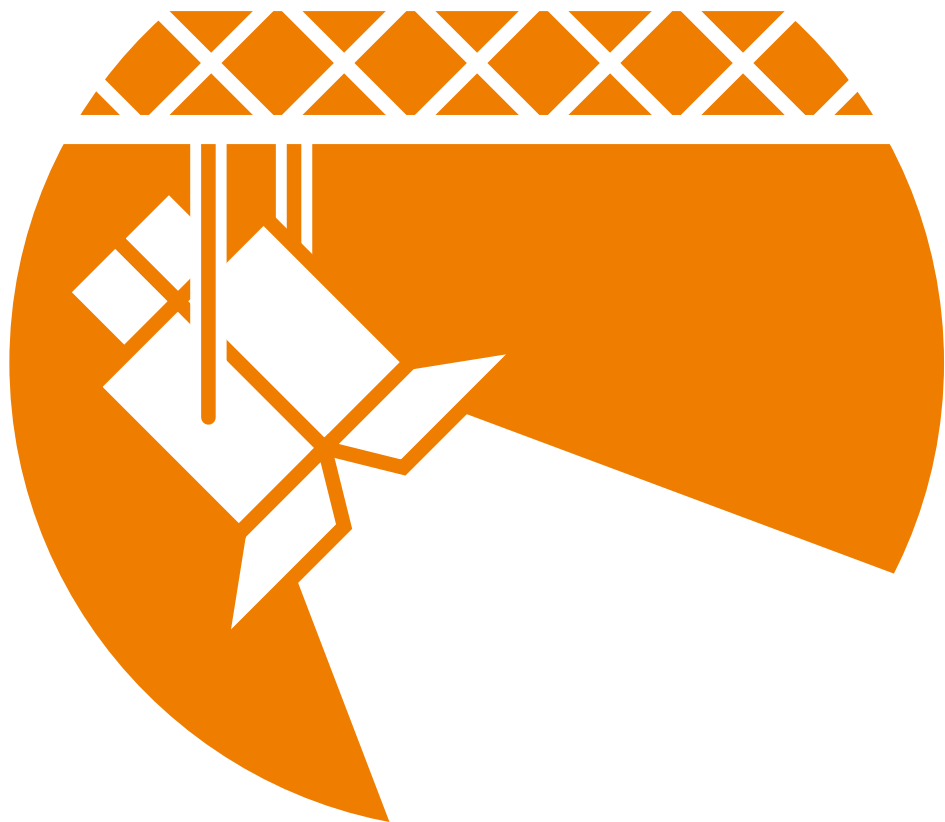


Stage

Solutions for theatre
and stage equipment



• plastics for longer life®

igus®.eu...

www.igus.eu/theatre



With igus® – the drama takes place on stage and not behind the scenes!

Your technical innovator and cost saver.

Thomas Piepenbring

Industry Manager Stage Technology

Phone: +49 2203 9649-740

Mobile: +49-173 4538065

e-mail: tpiepenbring@igus.net

www.igus.eu/theatre

Setting the scene for the stage in a silent and invisible way with motion plastics®: freedom of movement with systems and components made of plastic, whilst reducing costs.

The challenge for every stage builder is to create the perfect stage. Every job is different, because stages are not off the shelf. Each one is unique, which means that each and every component not only has to be strong, durable and efficient but must also fit together perfectly. In order to achieve this you need a competent partner who understands the specific problems in stage technology and offers a wide range of products with which any stage application can be realised.

igus® GmbH is an expert in the field of energy supply and provider of highly flexible cables for dynamic applications. But igus® can do more. With motion plastics®, high-performance plastics for moving applications, new solutions are available for theatre and stage construction, where very high technical requirements prevail. igus® offers system solutions that are tailored to the specific conditions in this industry. As igus® provides modular systems and a wide range of components, it is possible to implement customised applications quickly and easily. Ideal for an industry where every theatre, every opera house and every stage is one of a kind.

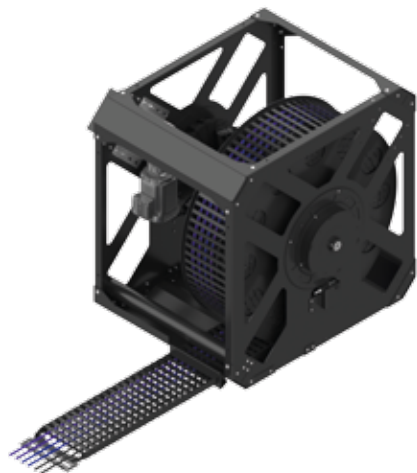
**e-spool: the slip-ring-free solution for
cable guidance in theatres and venues**



Staging dreams with mobile energy supply systems

e-spool: the alternative to the cable drum - without slip rings

Traditionally, cable reeling drums of various sizes are used for cable guidance on stages. However, they are reaching their technical limits in many respects, in particular with the ability to accommodate different cable types, and also the noise generated. The e-spool from igus® provides a reliable alternative that is ideally suited for noise-sensitive applications. The system is extremely compact and is able to guide a large number of different power, data, audio or pneumatic cables in very confined spaces. This design, this is a combination of two proven igus® product families, long-lasting e-chains® and the flexible "twisterband". The continuous movement of the cables is reliable and safe due to the use of e-chains®.



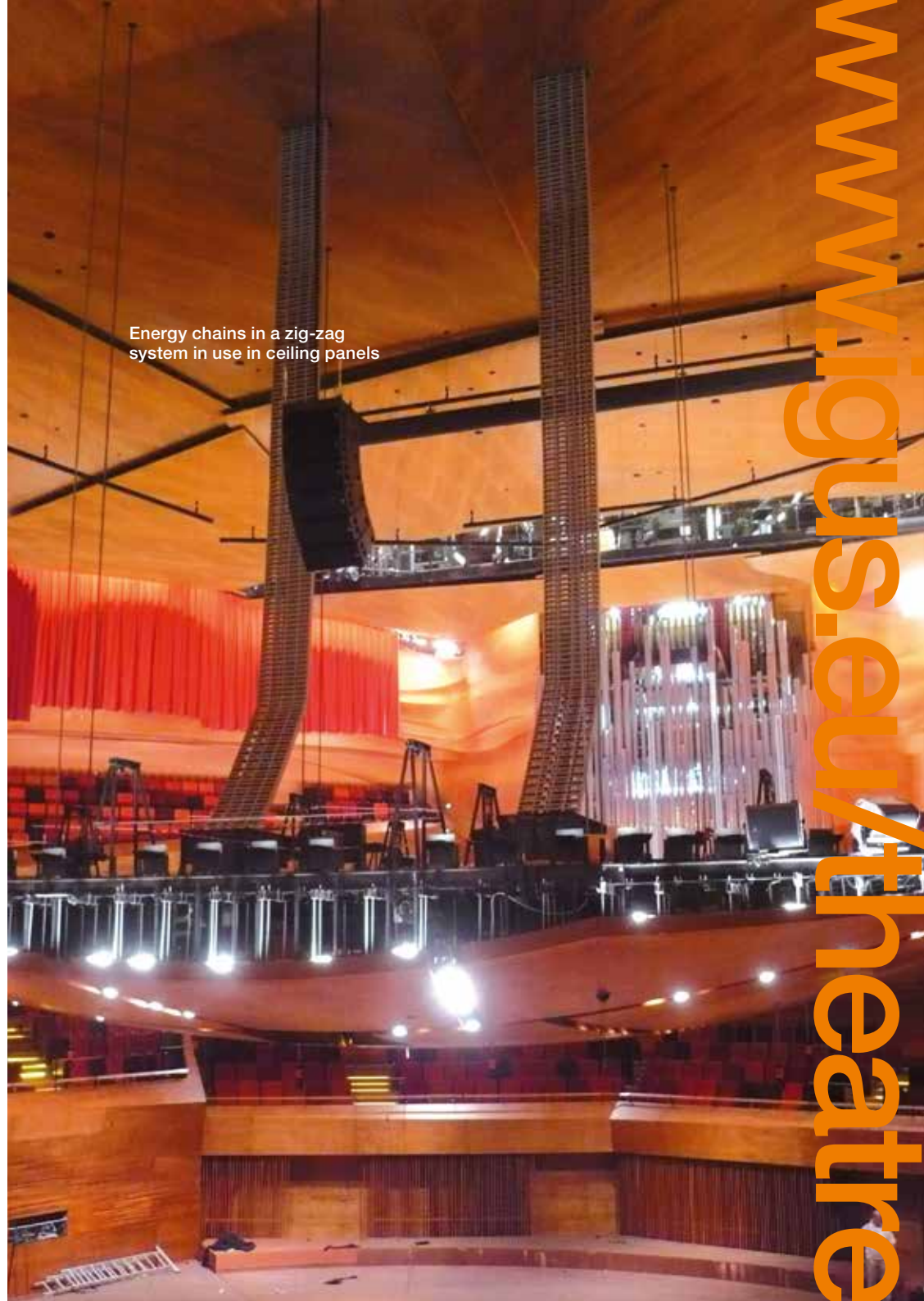
Zig-zag: unconventional solutions for unconventional theatres

Modular design and flexibility of e-chains® allow a creative solution for vertically hanging applications that is not only cost-effective, but also very space-saving and inconspicuous. If stages or heavy stage platforms have to be moved, lifting heights of many metres and heavy loads have to be managed. Until now, conventional systems are noisy, large and visually intrusive. With the "zig-zag" installation method using e-chains® from igus®, there is an effective alternative to this, which is characterised by its compact design.

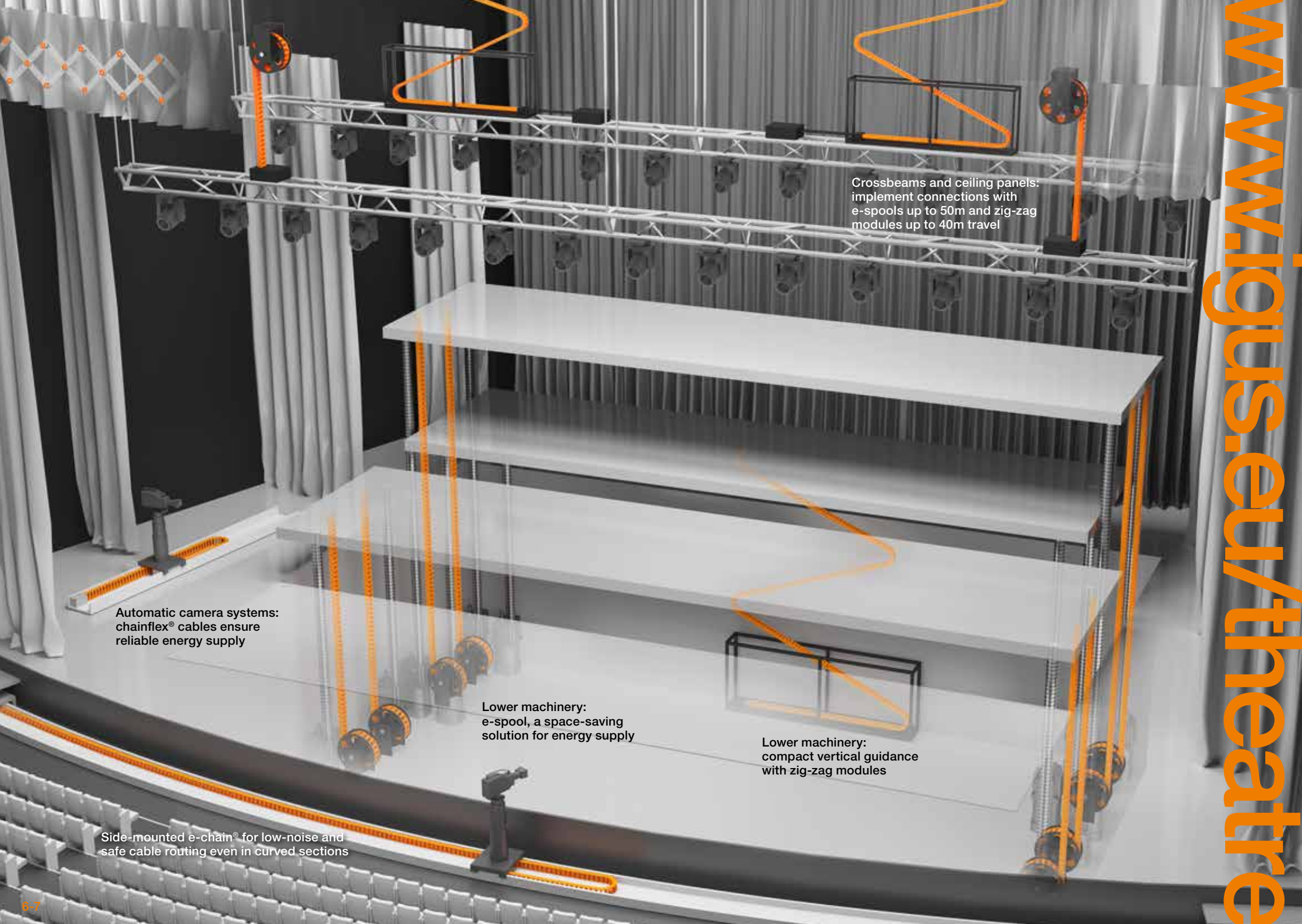
Zig-zag modules:
space-saving and reliable
vertical guidance for
energy, data and media



Energy chains in a zig-zag system in use in ceiling panels



www.igus.eu/theatre



Crossbeams and ceiling panels:
implement connections with
e-spools up to 50m and zig-zag
modules up to 40m travel

Automatic camera systems:
chainflex® cables ensure
reliable energy supply

Lower machinery:
e-spool, a space-saving
solution for energy supply

Lower machinery:
compact vertical guidance
with zig-zag modules

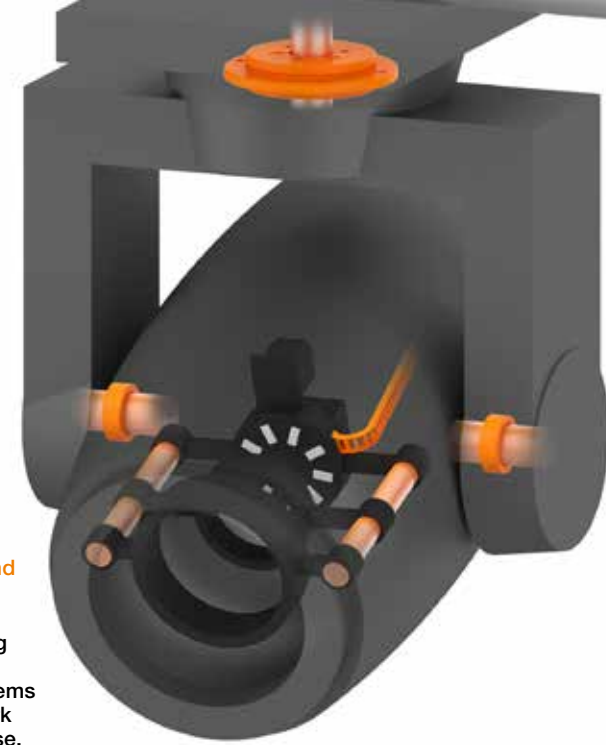
Side-mounted e-chain® for low-noise and
safe cable routing even in curved sections

igus® makes it big in theatre: with e-spool, zig-zag and dry-tech®

e-spool with twisterband for rotary movements in small spaces - 20 times around its own axis
With the compact igus® twisterband, rotations can be achieved cost-effectively, with low wear and low maintenance, even in a confined space. Power, data, audio and liquids are securely guided.
www.igus.eu/twisterband



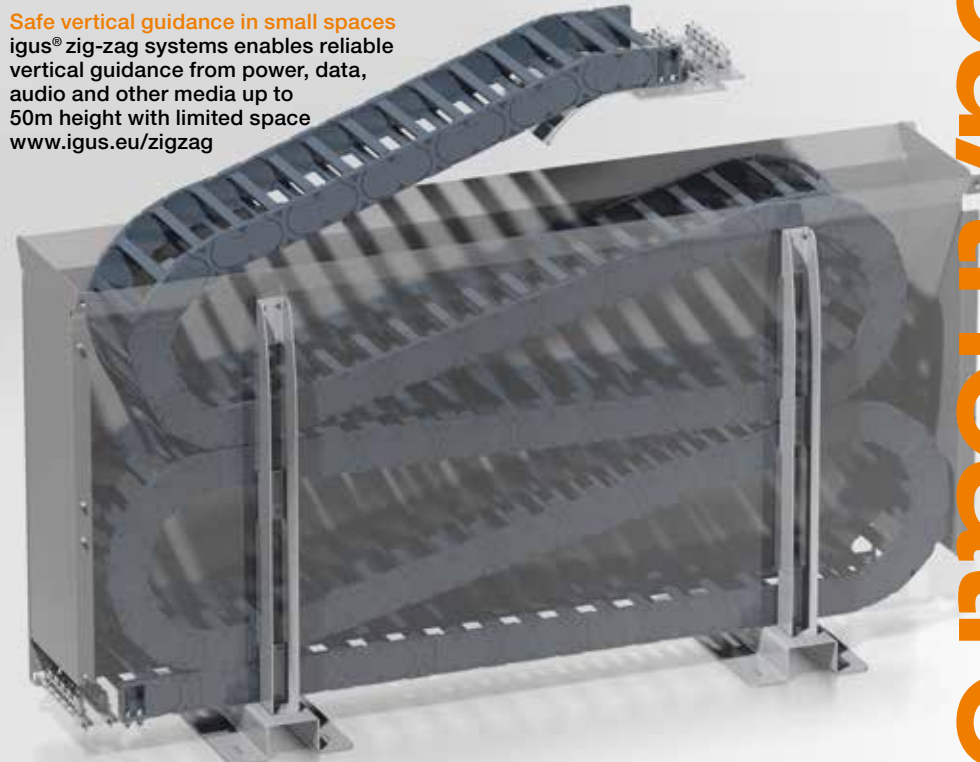
Maintenance-free and clean guidance
Linear guides, plain bearings and slewing rings are commonly used in lighting systems because they all work without oil and grease.
www.igus.eu/dry-tech



Seat adjustments smooth and without grease
igus® plain bearings and linear guides can be used without lubrication. No contamination with oils and grease, very smooth and precise.
www.igus.eu/dry-tech



Safe vertical guidance in small spaces
igus® zig-zag systems enables reliable vertical guidance from power, data, audio and other media up to 50m height with limited space
www.igus.eu/zigzag



www.igus.eu/theatre

chainflex® works - world No. 1 in terms of service life guarantee

Fail-safe cables for energy chains - with guarantee

- Avoids core rupture and short circuits
- No corkscrew effects
- Minimal abrasion, for tough environments
- For the best EMC results even with torsion movements such as in robots
- Reliable data transmission CAT5, CAT5e, CAT6, CAT6A, CAT7, Profinet, Profibus

www.igus.eu/chainflex



Guarantee
igus chainflex
36
month guarantee

36-month chainflex® guarantee

Avoid failures, guaranteed - more than 2 billion test strokes and 1.4 million electrical measurements per year. For almost 30 years, igus® has been carrying out tests in the industry's largest laboratory for moving cables and energy chains.



www.igus.eu/theatre

The readycable® finder: find the most cost-effective cable, fast



Ready-to-install harnessed cables - readycable®

Ready-to-connect harnessed cables, with guarantee, for use in energy chains. As a manufacturer and harnesser, igus® provides everything from a single source, reducing processing time and the number of suppliers. The portfolio includes an extensive range of catalogue products.

- 4,600 harnessed drive cables in accordance with 24 manufacturer standards: Allen Bradley, B&R, Baumüller, Beckhoff, Berger Lahr, Bosch-Rexroth, Control Techniques, Danaher Motion, ELAU / Schneider Electric, Fagor, Fanuc, Festo, Heidenhain, Jetter, Lenze, LinMot, LTI DRIVES, NUM, Omron, Parker, SEW, Siemens, Stöber
- Individually customised or high-volume production
- Numerous cable types, of different quality levels, with different approvals and certificates of conformity
- Extensive quality checks and functional tests for all components

www.igus.eu/readycable



... that is guaranteed to work!

For all data volumes and types of movement - 32 chainflex® Ethernet cables

From CAT5 to CAT7, we can supply you with exactly the Ethernet cable you need for your moving application. With that you can safely use Bus systems such as Ethernet/IP, Profinet, EtherCAT, Sercos and many other derivatives. The different classes of cable means that there are opportunities for very large **savings** or for the cabling of your equipment in a way that meet your needs in the future. We can deliver your required length on drums or in coils – **without any cutting charges**. Upon request, we can also harness your cable with suitable connectors. No minimum order quantity, to your custom dimensions and designs. **A new addition to the product range** is our **CFBUS.LB** for especially small radii of 7.5 x d.

www.igus.eu/Ethernet

the most cost-effective drive cable

Easy searching

Service life



www.igus.eu/threatre

Stage platform
in Cologne
opera house :
guide different
media while
saving space



e-spools and zig-zag e-chains® perform their tasks in the platform workings at Cologne opera house, ensuring supplies of power, data and hydraulics to move the stage platform. They are cost-effective and can be installed in tight spaces thanks to their compact design.



www.igus.eu/theatre

Guiding energy safely and inconspicuously: igus® in the Warsaw National Theatre

Clearly defined bend radii guarantee a long service life for cables. chainflex® cables with the smallest bend radii reduce the required installation space

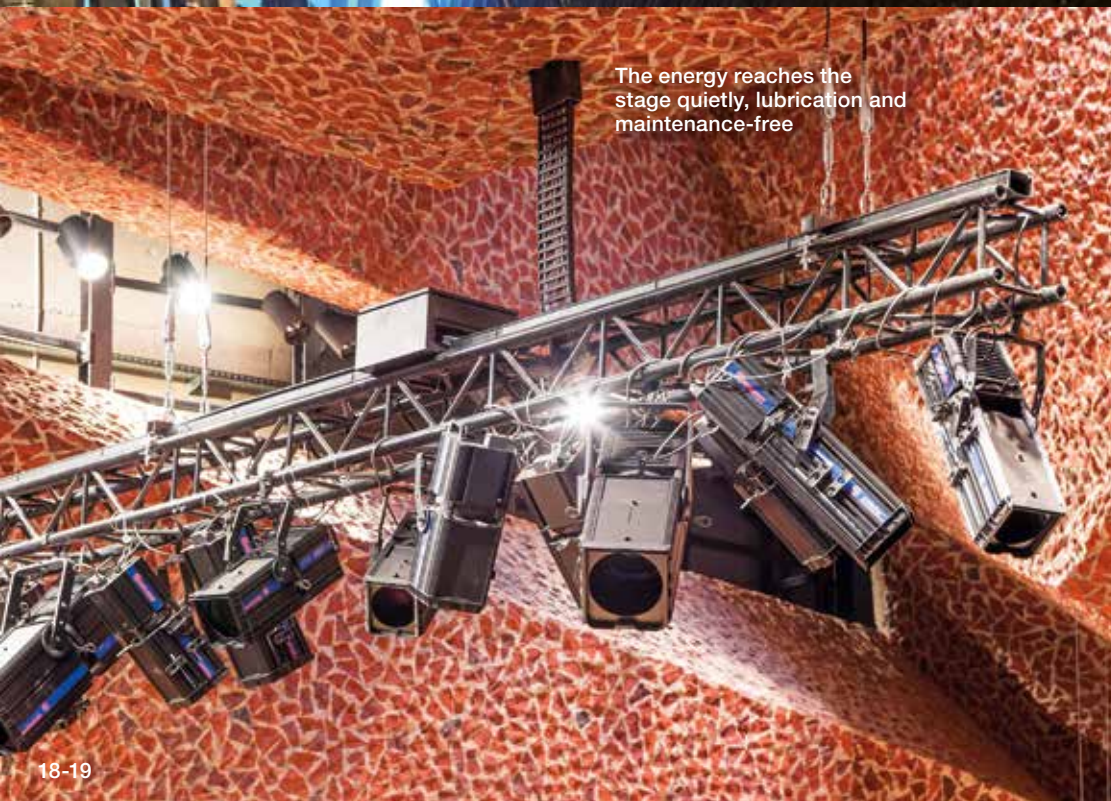
In above-stage equipment, cables leading to crossbeams and stage lighting systems must be guided safely and reliably but be visually inconspicuous. igus® products can help you to technically optimise your application whilst also cutting costs. In many cases, they are suitable for use where space is at a premium, whilst being quiet and with very low vibration.



www.igus.eu/theatre



Hidden: e-spool as a space-saving solution for energy supply in upper machinery



The energy reaches the stage quietly, lubrication and maintenance-free

e-spools bring energy safely to the stage

igus® e-spool - the problem solver and cost saver for stage and theatre technology

Guiding many different cables in a small space: e-spool uniquely combines two different energy supply systems. The one standard e-chain® is guided by a roller and always provides the correct length and tension of the energy supply system through an integrated retaining spring. In the starting position, the e-chain® is rolled up completely to save space. The twisterband connects the roller with the shaft end block, which serves as an interface to the supply side. Unlike slip rings, cables and hoses for data, compressed air and fluids can also be connected end-to-end and, above all, can be replaced or altered at any time. e-spool is proven, especially in theatre and stage applications, (indoor) cranes, maritime and ship building. It offers an ideal solution for telescopic/retractable applications, stage and lighting technology and a space-saving alternative to zig-zag solutions.

The main advantages:


- Flexible use: energy supply in any direction is possible
- Cost-effective: twisterband enables rotary movement without slip rings
- Flexible energy supply: guidance of different media in one system
- Space-saving: e-chain® retracts into a compact unit



www.igus.eu/theatre



Robotic camera in news studio: quiet energy supply



Smooth running, low vibration and high wear resistance are important criteria for the individual components of studio equipment. Here, igus® E6 series energy chains are used to supply the robot systems in news and television studios. The E6 system is extremely quiet and has low vibration due to a small pitch and a special connection of the chain links.

MAC Encore
Performance:
the smallest
installation space
and light weight



Martin Professional
by HARMAN

The stage lighting systems must be light weight, and operate quietly and reliably. By using igus® high-performance plastics, spotlights can run lubrication and maintenance-free. Plastic plain bearings and linear guides from igus® allow quiet and smooth movement because they do not use metal balls. igus® plastic components are used in MAC Encore Performance Moving Light spotlights. Self-lubricating and maintenance-free linear modules with motors and smallest energy chains have proven their worth in this application.



Photo Stefan Junker,
Production Partner

www.igus.eu/theatre

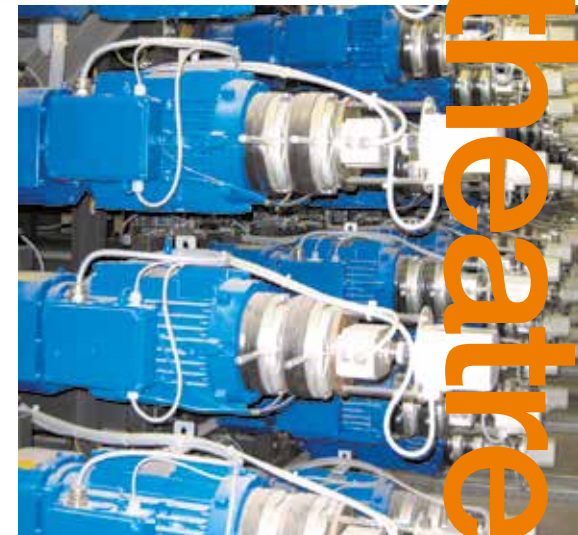
Movecat hoists:
powerful
lubrication,
maintenace-free
and safe



Movecat hoists VMW-S 125-3-30

e-chains® and drylin®R linear guides have proven themselves in winches. Movecat based in Nufringen, Germany, uses igus® products for its VMW-S series winches.

Photo right: Dresden-based SBS Bühnentechnik GmbH uses igus® plain bearings, among other things, to deflect the ropes used in stage equipment. Lubrication-free iglidur® plastic plain bearings withstand even the toughest environments.



www.igus.eu/theatre

drylin® W in stage lifting device: extremely tough and quiet

Save costs and avoid lubrication

drylin® linear guides run on polymer high-performance sliding elements and achieve the best coefficient of wear and friction. This principle allows a lubrication-free as well as maintenance-free dry operation. As a result, maintenance times are significantly reduced and costs incurred by process stoppages are saved.



www.igus.eu/theatre



Rotary energy chains: circular guidance for power, data, air and liquids

- Rotating 360° and more
- Rotary speeds up to 360°/s
- Ready to install, custom solutions

 www.igus.eu/RBR



drylin® W in stage lifting devices: quiet linear movement

- Heavy-duty supported shafts with corrosion and maintenance-free guidance
- Modular solutions for maximum design freedom
- Especially quiet running

 www.igus.eu/drylinW



igidur® J in seats: space-saving, quiet, no oil or grease contamination

- Low profile for the smallest installation spaces
- Maintenance-free and dust-repellent
- Also available as a lockable version

 www.igus.eu/J

drylin® W hybrid bearings for monitor adjustment: low movement force due to integrated roller

- Resistant to dirt, humidity, heat or vibration
- Low movement force and smooth operation
- Maintenance-free dry operation

 www.igus.eu/drylinW

drylin® SHT for video walls: flexible and precise with maintenance-free dry operation

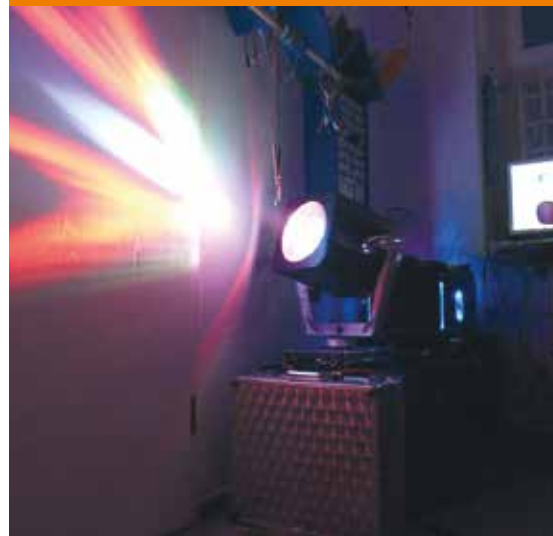
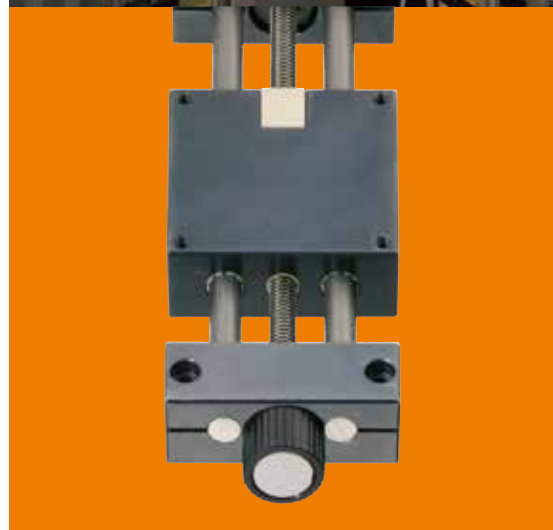
- Lubrication-free adjustment
- Precise and robust components
- Drive given either via hand wheel or motor

 www.igus.eu/drylinSHT

iglidur® PRT slewing rings in moving-head spotlights: maintenance-free

- Wear-resistant with interchangeable sliding elements
- For high loads and high rigidity
- Many designs available from solid plastic slewing rings up to toothed slewing rings

 www.igus.eu/PRT





drylin® ZLW: 100% maintenance and lubrication-free toothed belt axis

- Fast positioning for small loads
- Quiet and small dimensions
- For small installation spaces

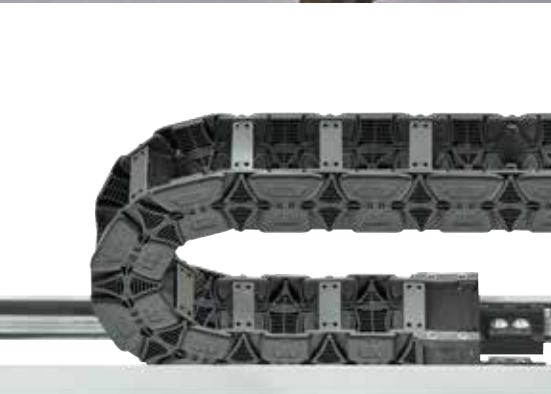
 www.igus.eu/drylinZLW



drylin® linear guide systems for camera carriages: adjustable brake level

- Wear-resistant, smooth and quiet motion
- Adjustable brake level
- Lubrication-free, easy and fast installation

 www.igus.eu/movie



E6.1 e-chain®: very quiet, for high dynamics and smooth operation

- Extremely quiet construction of the energy chain (E61.29.070.055.0 at 1m/s = 32dB(A) according to igus® internal test 4479)
- Extremely low vibration
- For many installation types, even for circular movements.

 www.igus.eu/E6.1

www.igus.eu/theatre

Safely route cables for vertically moving stages

- Heights of over 100m are possible with igus® e-chains®
- Different cables and services can be guided together in one system
- No tangling of cables or hoses



www.igus.eu/design



twisterband: up to 7,000°* rotary movements in the smallest spaces

- Rotary speeds up to 360°/s
- Minimum installation space, fits tightly around the rotary axis
- Can be used reliably in various installation positions (horizontal or vertical)



www.igus.eu/twisterband

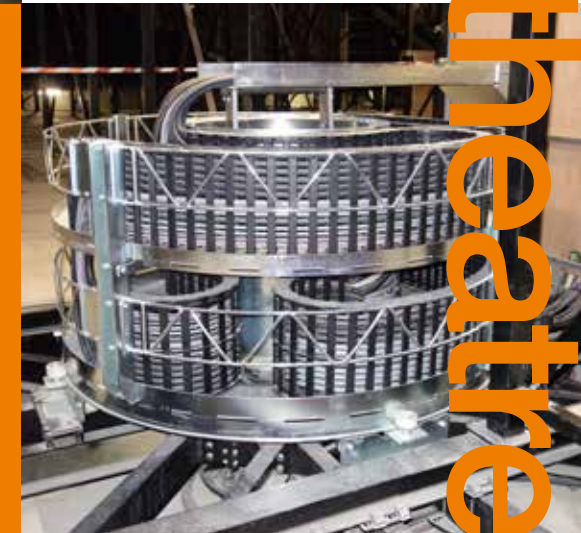


Rotary modules: reliable circular guidance for high loads

- Optimised and reliable guidance of fibre optic and other data cables
- Complete system designed and assembled according to the customer request
- Reliable circular guidance of energy, data and media guidance up to 900° at high loads



www.igus.eu/theatre



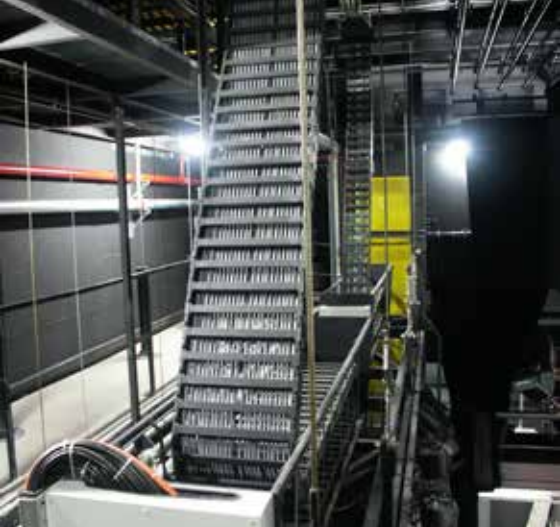
www.igus.eu/theatre

Ready-to-fit



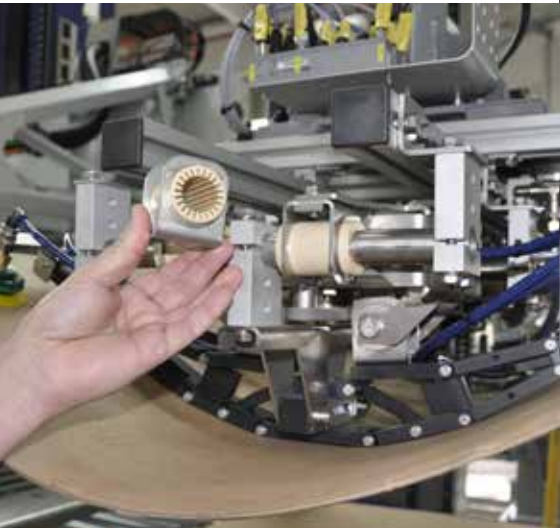
- Harnessing for fast, error-free installation
- Specialised assembly team

www.igus.eu/assembly



Industrially harnessed and ready to install : www.readychain.eu

Always the right harness for your application. Ready-to-fit readychain® e-chain system® configured and delivered in 3-8 days. This is possible due to the large selection of energy chains for all kinds of motion; cables for e-chains® complete with the relevant connectors. Reduce the number of suppliers and orders by 75%. Maximise machine service time. System guarantee - depending on the application.




Samples



- We can provide support in the design 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 connectors
- Standard+**
Harnessed e-chain systems® with associated sheet metal parts
- Premium**
Ready-to-install complete system mounted on transport rack



Engineering



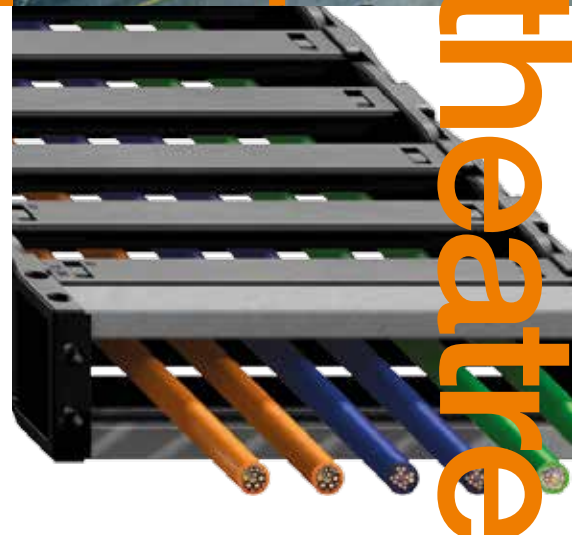
- Customised products
- Many solutions from the "modular construction system" www.igus.eu/engineering



The type of harnessing most frequently used in stages

Basic
e-chain® with fitted cables

www.igus.eu/RCbasic



www.igus.eu/theatre



Long-term durability : 10 billion e-chain® cycles per year in e-chains® and the chainflex® laboratory

Cable testing ...



- Fibre optic cable tested for the smallest radii
- Service life test for torsion in e-chain®
- Twisting of +/- 180°

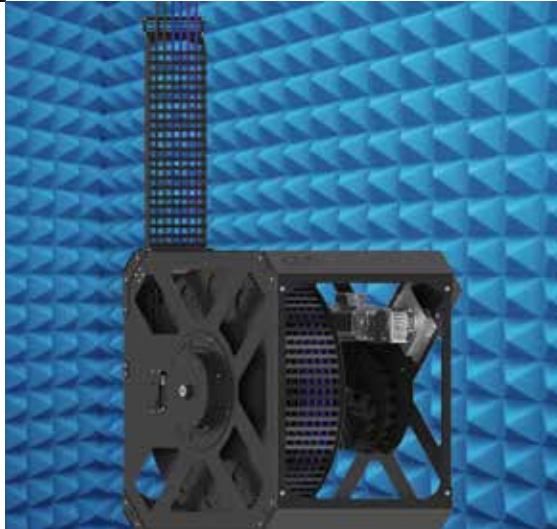


Extensive test database

Noise test ...



- Tests in the laboratory prove the quiet running
- An e-spool equipped with 'anti-vibration matting' was able to reach levels below 46dB(A)



Continuous load linear guide ...



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



Vibration / noise test in igus® own noise chamber. Many igus® e-chains® also with TÜV certification

Torsion test ...



- twisterband with chainflex® cables
- Test for torsion and twisting
- Rotate up to 7,000°



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

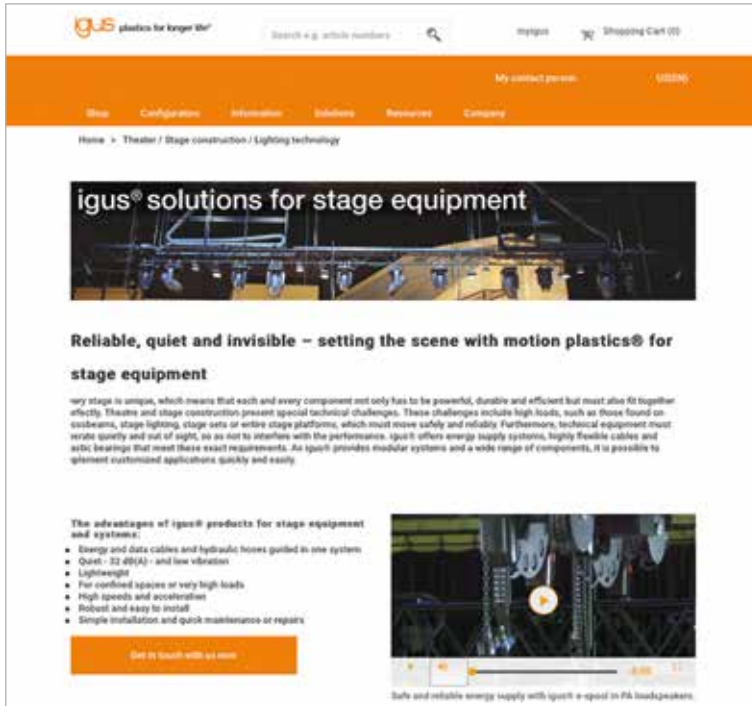
www.igus.eu/test

www.igus.eu/theatre

igus.eu/24

Buy online - 24hrs!

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 parts 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 the igus logo, a search bar, and a shopping cart icon. Below the navigation bar, there is a main content area with a large image of stage equipment and a list of advantages. The text on the page reads: "igus® solutions for stage equipment", "Reliable, quiet and invisible – setting the scene with motion plastics® for stage equipment", and "The advantages of igus® products for stage equipment and systems: Energy and data cables and hydraulic hoses guided in one system, Quiet - 32 dB(A) - and low vibration, Lightweight, For confined spaces or very high loads, High speeds and accelerations, Robust and easy to install, Simple installation and quick maintenance or repairs".

Always the right solutions for theatre and stage equipment. igus® is certified in accordance with ISO 9001:2015 and IATF 16949:2016 in the field of energy supply systems, cables and harnessing, as well as plastic bearings.

igus® GmbH
Spicher Str. 1a
D-51147 Cologne
Phone: +49 2203 9649-0
info@igus.de
www.igus.eu

igus.eu

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