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.

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

Zig-zag modules: space-saving and reliable vertical guidance for energy, data and media
Automatic camera systems: chainflex® cables ensure reliable energy supply

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

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

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, air and liquids are securely guided. www.igus.eu/twisterband

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

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

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
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

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.
Ready-to-install harnessed cables - ready cable®

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

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

www.igus.eu/theatre
Stage platform in Cologne opera house: guide different media while saving space.

E-spool 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.
Guiding energy safely and inconspicuously: igus® in the Warsaw National Theatre

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.
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
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

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.

Martin Professional by HARMAN

Photo Stefan Junker, Production Partner
Movecat hoists: powerful lubrication, maintenance-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.
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.
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

iglidur® 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

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
www.igus.eu/drylinW
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
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
Ready-to-fit

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

www.igus.eu/assembly

Samples

- We can provide support in the design phase of your machine

www.igus.eu/sampling

Engineering

- Customised products
- Many solutions from the "modular construction system"

www.igus.eu/engineering

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.

The type of harnessing most frequently used in stages

Basic
- e-chain® with fitted cables

www.igus.eu/RCbasic
Test for torsion and twisting
- Rotate up to 7,000°

Extensive test database
- 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

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

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

Torsion test ...
- Twisterband with chainflex® cables
- Test for torsion and twisting
- Rotate up to 7,000°

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

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

© 2019 igus® GmbH
Published by igus® GmbH, Germany
MAT0074226.20  Issue 04/2019
Subject to technical alterations.