

# Cost down ... life up!

### Improve technology and reduce costs!

Optimize your application technologies with new innovations, designed to improve operations and save money. With more than 50 years of experience in the field of engineered plastic components, igus® has equipped more than 10,000 port machinery applications.

All of our products are tested under realistic conditions in the largest test lab of its kind, located at igus® headquarters in Cologne, Germany. Nearly all igus® parts are available from stock, and ready to ship as early as the same day.

Learn more on our industry page at www.igus. com/cranes. Find detailed product information, helpful online tools, and order online. Please contact me with any questions about cable management for your next crane application.

I hope to hear from you soon!



Sean McCaskill Engineered Systems Product Manager smccaskill@igus.com



### Shipping in 24 hours\*

Most orders leave igus<sup>®</sup> within 24 hours. On request we can deliver via express or special delivery. Please inform us about your wishes.



### No minimum order

igus® requires no minimum order. Just order the amount you need.



### With warranty

Beyond the legal warranty we also vouch for wear and tear. Together with you, we define your application's parameters for a warranty certificate!



### igus® catalogs

Order igus® catalogs online www.igus.com/catalog



### Ordering times

From Mon to Fri 8:00 am - 6:00 pm EST



### Hotline

Phone 800-521-2747 Fax 401-438-7270



### Shop online

See **www.igus.com**. There you can find our complete product range.

Location: Malaysia Travel: 65.6 (20 m)

Speed max.: 197 ft/min (60 m/min) Acceleration max: 1.31 ft/sec<sup>2</sup> (0.4 m/sec<sup>2</sup>)

e-chain®: 400-25-250-0

chainflex® types: CF300 / CF9 / CF11



# igus® products in cranes...

## Where to find igus®



Quiet and wear-resistant, for high speeds:

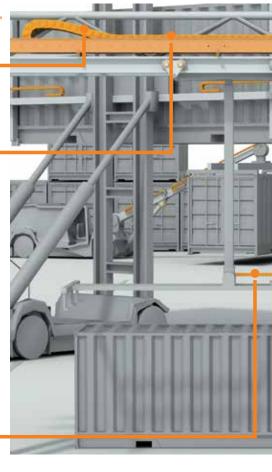
System P4

▶ page 12



Special solutions for long travels: rol e-chains®

▶ from page 10





For long travels and side-mounted applications:

System E4/4

▶ page 8



More than 1,000 cable types: chainflex®

▶ page 16



Harnessed cables and e-chains®:

ReadyCable and readychain®

▶ page 18

# indoor and outdoor



Remote force monitoring for heavy duty units:

PPDS Systems

▶ page 19



Power-Protective-System with misalignment control:

E-Rover

▶ page 21



Safe guide for e-chains® on long travels:

guide troughs and Aluminum Super Trough

▶ page 15



## Save cost

## Benefits of e-chain systems<sup>®</sup>: Reduce costs. Increase service life.



No loop station required – igus® e-chain system® example on an STS crane in Antwerp (system delivered as readychain®.

Installed on more than 3,500 RTG/RMG's, over 700 STS cranes, and more than 8,000 additional applications including spreaders, main power supply, reach stackers, lifts, empty container handling systems and fork lifts

- Speeds up to 1,968 ft/min (600 m/min) possible: bulk-handling cranes and STS crane applications with 984 ft/min (300 m/min) in use
- Space-saving design reduces cable length and height requirements
- No additional drives or control systems necessary
- All media in one system power, data, air, water, etc.
- Low maintenance
- Wind and weather resistant
- Other lines and cables can be added easily (e.g. chainflex® fiber optics)
- Possible travel up to 2,625 ft. (800m) with igus® rol e-chain®, applications with 1,641 ft. (500 m) on STS
  cranes travels in use
- Possible reduction of cable length > 50%
- No loop station required
- Overall steel structure can be shortened

# Many years experience

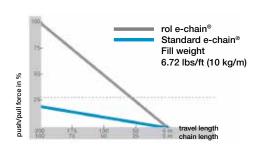
## Higher fill weights with rol e-chain® extension links

- On more than 1,000 cranes with more than 10 years market experience
- The optimal solution for high additional loads
- Low maintenance
- Reduction of the driving force required for moving the e-chain<sup>®</sup> by up to 75%
- Travels up to 2,625 ft (800 m) possible
- Possible speeds of up to 1,968 ft/min (600 m/min)
- Different types of rollers for optimum results in different situations
- Even rolling resistance for dirty applications
- System guarantee for engineered systems (depends on application)

Traditional e-chains® operating over long distances generally slide on themselves. rol e-chain® has been developed with the aim of pushing back the technical limits of this kind of operation. The demands placed on e-chains® used over long distances have continuously increased in recent years. Travel over several hundred feet creates new challenges, as do extreme crane movement speeds at cable loads of up to 33.6 lbs/ft (50 kg/m).



1446 ft. (441 m) – one of the longest travels of igus<sup>®</sup>. Travels up to 2,624 ft. (800 m) possible





Safe operation with igus® rol e-chain®



Test rig for lifetime test

# e-chain® for cranes

# E4/4: The E4 family for long travels and side-mounted applications





# ... for all cases

## Construction kit and many accessories

### Interior separations for cables and hoses



- Standard separator, wide foot Separator for QuickLock crossbar Separator, narrow foot Asymmetrical separator
- Notch separator the new notch crossbar Lockable, full-width shelf

### Mounting brackets



- ◆ KMA with attachment capability on all sides
   ◆ Mounting brackets with profile rail
- ► KMA, pivoting
   ► KMA, locking
   ► Mounting bracket made of steel

### Chainfix strain relief elements













 Improved housing foot clamp for easy fit into profile rail ● Integration with igus® KMA mounting brackets possible ● Clip-on tiewrap plates for opening crossbars ● Tiewrap plates with clip-on connection for the profile rail ● Chainfix clip - Modular snapon for the profile rail 

Chainfix Nugget

### **Guide troughs**













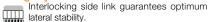
- ◆ Aluminum SuperTrough Basic
   ◆ Aluminum SuperTrough Heavy-Duty
   ◆ Fixed end module, aluminum SuperTrough
- Steel guide troughs Fixed end module, steel guide trough For support of the lower run Support Tray tool kit

### 1. Large unsupported length



Large unsupported length (+20% compared to E4/00) possible thanks to special stop dog, tongue and groove combination.

### 2. Rigidity for shear forces



### 3. Side-mounted application



Also best suited for side-mounted applications due to tongue and groove design

### 4. Cable protection



Smooth, solid support for cables, many quickly mounted shelving options.

### 5. Low noise



Integrated "brake", smooth gliding surfaces; rubber dampers optional.

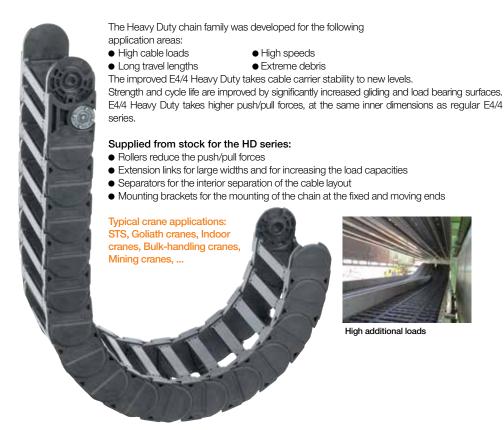
### 6. Straight run

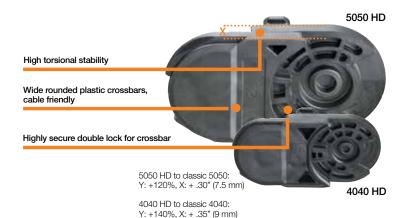


High push-/pull forces through tongue and groove, no "camber" option by flipping the outer link.

# For long travels

## rol e-chain® - Special solution for long travels





# For long travels

## rol e-chain® - Special solution for long travels



### rol e-chain® - Rolling instead of gliding

e-chains® are being used in ever longer travels. This has driven the development of the rol e-chain®. Additionally, movement speeds are increasing in combination with larger and larger fill weights up to 33.6 lbs/ft (50 kg/m).

- Reduces required drive power by up to 75% for moving the e-chain®
- Travels up to 2,625 ft (800 m) possible
- Speeds up to 19.69 ft/s (6 m/s) possible
- Various roller types for optimum application
- Can be used even in dirty environments
- Available as ready-to-fit, pre-harnessed system
- System guarantee for engineered systems



# For very long travels and high spee

## Large modular P4 system



The igus® P4 rol e-chains® are the best solution for the longest travel at high speeds. They are smooth running and energy-efficient – requirements that are demanded by many crane manufacturers today.

Standard rol e-chain® has been used in over 1,000 installations worldwide. Some industries, including cranes, have increasing demands for length of travel, fill weight, and speed.

- Identical pitch of the chain link with or without roller
- Smooth, low noise operation through identical pitch length for links with and without rollers
- Integrated roller in the side link
- Long travels up to 2,625 ft (800 m), high additional loads up to 20.2 lbs/ft. (30 kg/m)
- For very long travels and high speeds > 32.8 ft/s (10 m/s) travel speed
- AUTO-GLIDE crossbars assist guiding in very long travels
- 4 different inner heights: 1.26" (32 mm), 1.65" (42 mm), 2.20" (56 mm) and 3.15" (80 mm) available
- Large modular accessory system with interior separations of the System E4



## Save 57% energy with the aluminum guide trough



### Additional widths

- System P4 in 5 widths
- 9.84", 11.81", 13.78" and 15.75" (250, 300, 350 and 400 mm) inner width
- Crossbars in cable friendly, rounded plastic
- Safe due to double lock mechanism.



### Extension link - heavy fill weights

- Roller extension link for series P4-56 and P4-80
- 50% higher fill weight possible
- Increased unsupported span
- Maximum rigidity
- Divides cross section into compartments (electric/hydraulic)

### Technical data:

Modular P4 system for very long travels and high speed:

- 2,625 (800 m) travels and more are possible
- > 32.8 ft/s (10 m/s) speed
- Heavy fill weight up to 6.72 lbs/ft (10 kg/m)
- Large rolling and gliding surfaces for long cycle life
- Safely on track through AUTO-GLIDE cross bars and guide trough
- Same pitch for roller links/chain links
- $^{\star}$  A reduction of 3 dB(A) sounds like a 50 % reduction in the noise level to the human ear.



### More bending radii

- System P4 in 3 bending radii: 250, 11.81" and 13.78" (300 and 350 mm)
- Large radii for stiff cables and hoses
- Small radii for limited space



## P4-32 with Aluminum guide trough

- Energy-efficient solution for long travels: -57%
- Highly dynamic even in cramped installations
- Very guiet, lightweight and slim design
- For fill weights up to 6.72 lbs/ft (10 kg/m)
- For long travels up to 2,625 ft. (800 m)
- No split roller, but as offset, runs smoothly



### Long-life rollers

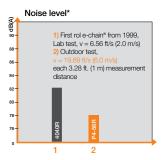
- Tribo-optimized plastic rollers for all P4 systems
- Wear optimized
- Long cycle life
- Improved rolling
- Lower noise and vibration
- Same pitch for roller links/chain links

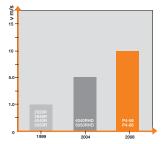


### Standard guide trough system

- Guide trough system
- Special geometry in combination with AUTO-GLIDE cross bars allows for offset
  - upper and lower run
- Strong installation kits for long life
- Stainless trough segments resist corrosion and sea water

### Travel speed igus® rol e-chain®





# **Guide troughs**

## Safe guide for e-chains® on long travels



Trough without glide bars - Chain glides on chain



Trough with glide bars – Chain glides on glide bars



Center mounted – 1/2 Travel with glide bars – 1/2 Travel without glide bars





**HD-Installation set** 



### igus® Guide Troughs

Guide troughs are used for long travels from 16.4 to 32.8 ft. (5 to 10 m) and more, depending on the chain type.

They allow igus® e-chains® and E-Tubes to continue smooth, low-friction operation in these long-travel situations.

If the e-chains®/tubes are installed in the center of the travel ("center-mounted"), they glide on themselves for half the travel. For the other half, we recommend glide bars, which are assembled in the trough and on which the e-chains®/E-Tubes glide. igus® guide troughs are available from stock with these highly abrasion-resistant glide bars, which perform well with igus® e-chains® and E-Tubes regarding noise, abrasion and friction.

### Type of Trough

igus® provides guide troughs made of

- Aluminum (seawater resistant according to EN6060)
- Stainless steel (1.4301 + 1.4571)
- Steel (zinc plated)

### Trough assembly

If the igus® installation sets are used, the guide troughs are particularly easy to assemble. All the troughs are constructed according to the same basic principle. All sizes use a common profile rail on which the guide parts are assembled. The assembly brackets used vary in height only.

Typical crane applications: STS, Goliath cranes, RMG's, Bulk-handling cranes

For heavy applications: HD-Installation set for joint and attachment surface connections secure connection without misalignment and without welding

### Fixed end module for steel troughs

Until now, the steel trough had to be modified on site to fit the mounting brackets at the stationary end of the e-chain®. That is now history. With its prefabricated bore holes, the 78.7" (2,000 mm) long kit can be used for middle-feed, end-feed and opposed installation.

- Fast attachment of mounting brackets thanks to prefabricated bore holes
- Fast installation of profile rails for strain relief
- Fast bolting of glide bars

# SuperTrough

## A light version of long travel guides in aluminum



# Aluminum Super Trough – Crane version

Lightweight guide troughs are available for the demanding crane industry with the Aluminum SuperTrough system. This trough system is designed with stronger installation brackets and add-ons including glide pads for protection against friction and wear, as well as silencer profiles to reduce the noise level of the e-chain system®

### Modular Trough System

- Modular system with add-on accessories for heavy-duty applications
- Flexible assembly; connects to mounting surface, independent from profile length and location of trough section interfaces
- Various methods of fixation with installation brackets, slide on fasteners, and interface connectors
- Wear protective, side-mount glide bars available for high speed applications
- Resistance to corrosion caused by seawater
- Available for most series of igus<sup>®</sup> e-chains<sup>®</sup> series



Aluminum SuperTrough – installed on a RTG application

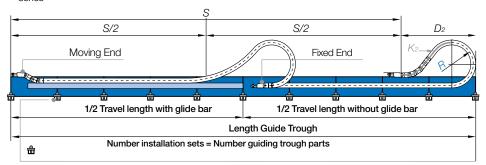
### Seawater resistant according to EN 6060



### Fixed end module for Aluminum SuperTrough

A quick fix for mounting the stationary end of an e-chain®, available for the Aluminum "SuperTrough". Fast and easy mounting is possible with this module for the fixed end, with no drilling required without any drilling.

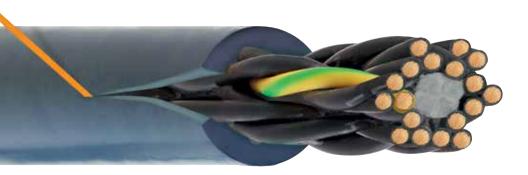
- Fast mounting of the e-chain<sup>®</sup>
- Quick relocation of the stationary end
- No drilling necessary



Schematic operating mode of an e-chain system® for long travel application with center-mount configuration. (Fixed end in the middle of the travel length)

# Cable design

## More than 1,000 chainflex® cables from stock



# More than 1,000 chainflex® cables developed especially for the use in e-chain systems®

- Wear resistant TPE, PUR and oil-resistant PVC outer jackets
- Halogen-free and/or flame-retardant materials
- Different certificates: UL, CSA, CE, DESINA, CEI
- Smallest radii up to 4 x d

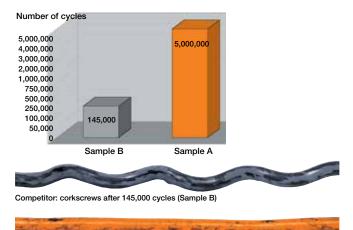


chainflex® control cable



chainflex® power cable

### Tested, tested, tested.



igus® CF27: even after 5 million cycles no wear! (Sample A)



Order your personal catalog:

www.igus.com/catalog

# chainflex® for cranes

## Overview of chainflex® cables for crane applications

Single conductor, CF330-D and CF340



The halogen-free single conductor for extra high mechanical demands on cranes and for plant engineering

- TPE UV-resistant outer jacket
- PVC-free/halogen-free

- Oil-resistant/Bio-oil-resistant
- Low-temperature-flexible
- Nominal voltage 0.6/1kV
- Bending radius inside e-chain®: 7.5 x d

### Halogen-free power cables, CF37-D and CF38



- demands on cranes and for plant engineering
   TPE UV-resistant outer jacket, gusset filled extruded
- PVC-free/halogen-free

- Oil-resistant/Bio-oil-resistant
- Low-temperature-flexible
- Nominal voltage 0.6/1kV
- Bending radius inside e-chain<sup>®</sup>: 7.5 x d

Four conductor power cables, CF30, CF31, CF34-UL-D and CF35-UL



Shielded power cables for converter operation up to 600/1000 V and up to 70 mm<sup>2</sup>.

Single conductor motor cables, - CF300-UL-D and CF310-UL



Shielded and unshielded single core motor cables for the most demanding requirements.

### Fiber optic cables



Fiber glass (62.5/125 or 50/125), 2, 6 or 12 fibers – all fiber optic cables are tested for over several million flexing cycles.

### Single conductor CF CRANE



Shielded highly flexible single core for up to 6/10 kV. Medium voltage cable for the most demanding requirements in crane building, heavy machinery, etc. Cross sections:  $1 \times 25/16$  to  $1 \times 95/16$ .

### Data cables, CF211, CF240, CF11



chainflex $^{\circ}$  data cables are available for all continuous data systems for the e-chain $^{\circ}$  application. Also in big cross sections, for example  $3 \times 2 \times 2.5$  mm $^{2}$  or with voltage supply cores in a cable.

### Control cables, CF5/CF6, CF9/CF10



PVC, PUR, TPE – A wide range to select from for all application areas – between shielded and unshielded cables and a large number of cross sections and number of cores.

# Harnessed e-chains®

## readychain®: harnessed e-chain systems® in 3-10 days

700 systems per week in 11 readychain®-factories worldwide. Ask for fully harnessed assembly-time saving igus® readychains® to increase your cash-flow immediately-

- Harnessed systems within 3 to 10 days
- Eliminate storage costs for cables, e-chains® and connectors
- Shorten turnaround times by half
- Flexible response to order fluctuations
- Reduce the number of subcontractors and related orders by 75%
- Minimize your machine downtimes
- System guarantee depending on your application

readychains® also available with assembly rack





Ready for filling. Harnessed systems up to 656 ft. (200 m) are possible.



readychain® installation by igus® supervisor on a bulk-handling crane. Weight of the e-chain® including chainflex® more than 2 tons.



Assembly-optimized delivery



Just in time supply

# Safe operation

## Push-Pull Force Detection System...Condition Monitoring

### Benefits:

- Prevents down time
- Prevents damage to equipment
- Saves money
- Improves operational safety through preventative maintenance and fine tuning of the system

### **Full PPDS System**

### Data input

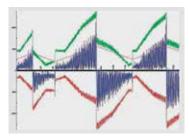
Nominal/actual comparison of force value at the tow arm, measured 4 times per second, relative to the position of the e-chain system®.

### • Data exchange options

Malfunction alerts as defined – through SMS, e-mail, fax. Remote data exchange, online or through e-mail.

### Data log

System data logout, retrospectively for up to 3 months, with a 128 MB memory chip. Alternatively incident-driven logout through modem memory.



PPDS – continuous real force measurement and position-sensitive analysis

### Easy PPDS System

- Low Cost Solution
- Data input: Push/Pull forces with freely selectable parameters.
   Measurement of the actual force on moving end
- Data exchange: Emergency shut-down of the system in case of overstepping of optional limit values.
- Data log: Data log for up to 40,000 entries



Easy PPDS – continuous real force measurement and limit comparison.

### "PPDS basic"

So far the realization of condition monitoring systems was limited to large-scale projects. Now PPDS basic makes this technology available for "standard" industrial appliances.

The simple force measuring function conducted at the mounting bracket of the e-chain® now also provides an emergency stop function for e-chains® in long stroke applications under 328 ft. (100 m) at a reasonable price.

- Low-cost system protection
- Emergency shutdown or alarming in case of system overload
- Space saving design



Typical Crane applications: STS, Goliath cranes, RMG's, Indoor cranes, Bulk-handling cranes

# **Customized**

## Necessary products for crane e-chain systems®



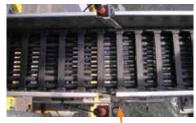
Floating moving arm on a STS crane for compensation of the lateral mismatch between trolley traveling path, crane traveling path and the readychains. Optionally these may include push/pull force control detectors with permanent nominal to actual parameter checks and emergency stop functions.



Hinge point guide trough: Port cranes are equipped with a lifting boom. To make sure that the boom and the girder sides of the crane are connected without misalignment of the guide trough igus® has developed a special attachment for the swivel point. This means that the chain can run on top, beside, or below the crane girder.



Rise protection: readychains® operate safely on long travels and with high acceleration. The retention device prevents the readychains® from climbing when the crane accelerates.



Hinge clutch at the hinge point including limit switch for connection control.



igus® housing installed on main trolley for STS: igus® offers special customized housings for protection of the readychains® against severe weather conditions.

# Safe on long travels

## E-Rover: Safe data, operation, power, energy, CO,



# Automatically couple and de-couple RTGs with electricity and data: The E-Rover from igus®

With the E-Rover, igus® has developed a system that automatically couples RTG cranes with an e-chain system® in an instant. Telescopic arm connects the energy-supply chain, which runs through a trough, with the RTG. This ensures a reliable energy supply and good data transmission – including via fiber optic cables.

- Reliable transmission of even fiber optic cable signals
- Reduces RTG operating costs
- Environmentally friendly
- Not sensitive to dirt
- Travels of 984 ft. (300 m) and more possible



# Project engineering ...

## Complete project service - from design to after sales service

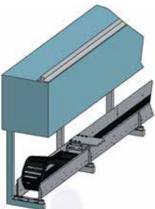


On-site support is part of the worldwide service and system guarantee

- Specific application solutions from igus® standard products to special designs
- Assistance from the layout up to the start of operations of every crane project
- After sales service in 48 countries, even after the end of the warranty
- All supplied components are available for a minimum of another 10 years after the delivery
- Supply of most parts from stock is guaranteed



igus® project drawings, developed in cooperation with the costumer



Customized 3D sketch

# including rotary systems





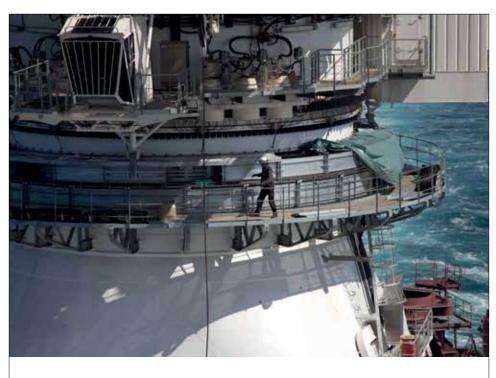
### INNOVATION: Windmill installation vessel

Operation area: North Sea Rotation angle: 900°

e-chains®: E4-56-60-200/6000-0 E4-56-60-300-6000-0

chainflex® cables: CF300, CF34, CF10 CFPE, CFLG, CFBUS

igus® has designed a customized rotary trough system for the Innovation and Vidar. Assembly and commissioning of both systems done at Crist Shipyard in Gdynia, Poland



# Research and development



Better products for less - a key element is the industry's largest test lab. 18,840 ft² lab, more than 15,000 tests and 2 billion test cycles 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.

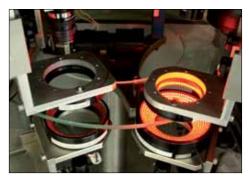
The industry's largest test lab conducts more than two billion test cycles per year on a total of 107 test rigs. This means they can be relied upon completely in the field.





Tribology testing in the plain bearing lab, igus® Cologne, Germany.

# 15,000 tests per year



### igus® quality assurance

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





Because iglide® is free of external lubricants, no contaminants are discharged into the environment.

Additionally, the low weight of iglide® plastic plain bearings reduce power requirements, making them better for the environment.



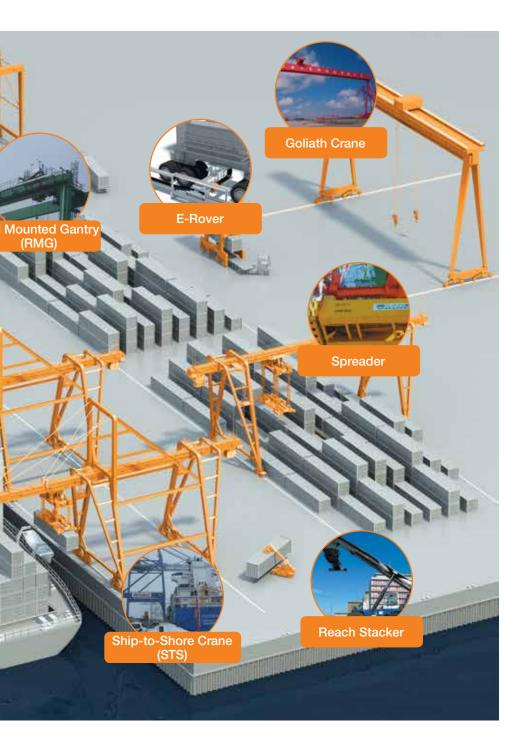


### Extensive test database

What is probably the world's largest database was created using the results of more than 15,000 tests run each year. This database gives us the ability to select the right product for your specific application.

# e-chain® can be used on ...





# STS cranes...

## igus® e-chain systems® in crane applications...worldwide



### **STS Crane**

Travel 3
Speed r
Acceleration max. e-chain® F
chainflex® Types C

Location

More references

Running since

393.7 ft. (120 m) max. 13.1 ft/s (4 m/s) 1.64 ft/sec² (0.5 m/sec²) P4-56-20-300-S40-0-AG CE300 / CE10 / CE9 / CELG

China Europe 2009



### STS Crane

 Travel
 327.4 ft. (99.8 m)

 Speed max.
 11.5 ft/min. (3.5 m/min.)

 Acceleration max.
 2.62 ft/sec² (0.8 m/sec²)

e-chain® 4040CR-15-200-S10-0-E

Location Europe
More references Worldwide
Running since 2009



### STS Crane

Travel 388.8 ft. (118.5 m) Speed max. 689 ft/min (210 m/min)

e-chain® 4040CR-22-250-0 chainflex® Types CF300/CF9/CF10/CFLG

Location Europe
More references Worldwide
Running since 2003



### **Double Trolley Container Crane**

Travel 157.5 ft. (48 m)
Speed max. 590.5 ft/min (180 m/min)
Acceleration max. 1.64 ft/sec² (0.5 m/sec²)
Cable weight 40 kg/m

e-chain<sup>®</sup> 5050R-12/10/12-300-0

Location Europe
More references Worldwide
Running since 1999

# RTG...RMG...

## igus® e-chain systems® in crane applications...worldwide



### **Container RMG**

 Travel
 370.8 ft. (113 m)

 Speed max.
 8.20 ft/s (2.5 m/s)

 Acceleration max.
 1.64 ft/sec² (0.5 m/sec²)

e-chain® chainflex® Types Location

Location

More references

Running since

P4-56-20-300-S40-0-AG CF300, CF330, CF9, CFLG

Germany Asia 2009



### **RTG**

 Travel
 64 ft. (19.5 m)

 Speed max.
 196.9 ft/min (60 m/min)

 Acceleration max.
 1.31 ft/sec² (0.4 m/sec²)

400-25-250-0

CF300 / CF34 / CF9 / CF11

e-chain<sup>®</sup> chainflex<sup>®</sup> Types Location

Location Panama More references Worldwide Running since 2000



### **RMG**

 Travel
 226.4 ft. (69 m)

 Speed max.
 3.94 ft/min (120 m/min)

 Acceleration max.
 1.31 ft/sec² (0.4 m/sec²)

e-chain® 4040R-31-250-0 Location Europe More references Worldwide Running since 2001



### **RTG**

 Travel
 65.6 ft. (20 m)

 Speed max.
 196.9 ft/min (60 m/min)

 Acceleration max.
 1.31 ft/sec² (0.4 m/sec²)

 Cable weight e-chain®
 9.8 kg/m

 e-chain®
 4040-46-300-0

 chainflex® Types
 CF34 / CF9 / CF11 / CFLG

Location Russia
More references Worldwide
Running since 2003

# Goliath...Spreader...

## igus® e-chain systems® in crane applications...worldwide



### Goliath crane

Travel 639.8 ft. (195 m) 131.2 ft/min (40 m/min) Speed max. .33 ft/sec2 (0.1 m/sec2) Acceleration max. 5050R-40-250-0 e-chain® chainflex® Types CF300 / CF9 / CF11

Location Asia More references USA Running since 2001



Travel 403.6 ft. (123 m) 131.2 ft/min (40 m/min) Speed max. Acceleration max. 1.64 ft/sec2 (0.5 m/sec2) e-chain® 40-15/15-250-0

Location Asia More references USA 1997 Running since



### Spreader

Travel 27.6 ft. (8.4 m) Speed max. 59.1 ft/min (18 m/min) Acceleration max. .33 ft/sec2 (0.1 m/sec2) e-chain® 3838-07-150-0

Location Asia More references Worldwide Running since 1998



### Spreader

Travel 27.6 ft. (8.4 m) Speed max. 49.2 ft/min (15 m/min.) Acceleration max. .33 ft/sec<sup>2</sup> (0.1 m/sec<sup>2</sup>) e-chain® 3838-10-125-0

Location Asia More references Worldwide Running since 1998

## Reach stacker...

## igus® e-chain systems® in crane applications...worldwide



### Reach stacker

Travel 25.6 ft. (7.8 m)

Speed max. 49.2 ft/min (15 m/min)

Acceleration max. 82 ft/sec² (0.25 m/sec²)

e-chain® 4040-15-250-0

Location Europe More references Worldwide Running since 2004



### Reach stacker

 Travel
 23.6 ft (7.2 m)

 Speed max.
 1.64 ft/min (0.5 m/min)

 Acceleration max.
 .82 ft/sec² (0.25 m/sec²)

 e-chain®
 5050-25-250-0

Location Europe
More references Worldwide
Running since 2000



### Reach stacker (cabin movement)

 Travel
 72.2 ft. (22 m)

 Speed max.
 49.2 ft/min (15 m/min)

 Acceleration max.
 .82 ft/sec² (0.25 m/sec²)

 e-chain®
 3838-20-150-0

Location Europe More references Worldwide



### Reach stacker

 Travel
 24.9 ft. (7.6 m)

 Speed max.
 49.2 ft/min (15 m/min.)

 Acceleration max.
 .66 ft/sec² (0.2 m/sec²)

 e-chain®
 E4-56-15-200-0

Location Asia
More references Worldwide
Running since 2008

# Indoor cranes...

## igus® e-chain systems® in crane applications...worldwide



### **Bulk-handling crane**

 Travel
 525 ft. (160 m)

 Speed max.
 65.6 ft/min (20 m/min)

 Acceleration max.
 1.64 ft/sec² (0.5 m/sec²)

 e-chain®
 4140-22-250-0

 chainflex® Types
 CF30 / CF7 / CF11

Location Europe
More references Europe
Running since 1998



### Grab crane

Running since

Travel 93.8 ft. (28.6 m)

Speed max. 262.5 ft/min (80 m/min)

Acceleration max. 98 ft/sec² (0.3 m/sec²)

e-chain® 400-25-300-0

chainflex® Types Location Europe

More references Worldwide



### Indoor crane

 Travel
 118.1 ft. (36 m)

 Speed max.
 229.7 ft/min (70 m/min)

 Acceleration max.
 1.64 ft/sec² (0.5 m/sec²)

 e-chain®
 290-17-200-0

 chainflex® Types
 CF31 / CF6 / CF11

Location Europe
More references Worldwide
Running since 1997



2000

### Steelcoil transport crane

 Travel
 124.7 ft. (38 m)

 Speed max.
 164 ft/min (50 m/min)

 Acceleration max.
 1.64 ft/sec² (0.5 m/sec²)

 e-chain®
 3838-25-250-0

 chainflex® Types
 CF31 / CF130 / CF11 /

CFBUS
Location Germany
More references Worldwide

# Heavy duty...

## igus® e-chain systems® in crane applications...worldwide



### Gantry crane

Travel Speed max. Acceleration max. e-chain®

chainflex® Types Location More references Running since

65.6 ft. (20 m) 3.28 ft/min (1 m/min) 3.28 ft/sec<sup>2</sup> (1 m/sec<sup>2</sup>)

5050-40-200-0 CF9 Europe Europe 2004



### Grab crane

Travel

69.9 ft. (21.3 m) (Trolley) 170.6 ft. (52 m) (Crane) Speed max. 4.36 ft/s (1.33 m/s) Acceleration max. .82 ft/sec<sup>2</sup> (0.25 m/sec<sup>2</sup>) 5050R-27-300-S10-0

e-chain® 5050R-35-350-S10-0 chainflex® Types CF5 / CF6 / CF30

Location Europe More references Europe running since 2003



### Mining crane

Travel Speed max. Acceleration max. e-chain® chainflex® Types

Location More references Running since

32.8 ft. (10 m) .33 ft/s (0.1 m/s) 1.64 ft/sec2 (0.5 m/sec2) 600-35-300/4650-0 Power-, data- and control cables

Europe Europe

2001

Speed max. Acceleration max. e-chain®

Location More references



### Waste crane

Travel

170.6 ft. (52 m) (Crane) 4.36 ft/s (1.33 m/s) 3.28 ft/sec2 (1 m/sec2) 5050R-35-350-S10-0-E

> 5050R-27-350-S10-0-E Austria

70.5 ft. (21.5 m) (Trolley)

Europe

# **Bulk-handling...**

## igus® e-chain systems® in crane applications...worldwide



## **Bulk-handling crane**

Travel 869. ft. (26.5 m)
Speed max. 3.28 ft/s (1 m/s)
Acceleration max. 1.64 ft/sec² (0.5 m/sec²)

e-chain® 4040CR-18-200-0 chainflex® Types CF9 / CFBUS / CF300 Location Germany

More references Europe
Running since 2009



### Straddle carrier

 Travel
 42.7 ft. (13 m) vertical

 Speed max.
 6.56 ft/s (2 m/s)

 Acceleration
 max. 3.28 ft/sec² (1 m/sec²)

e-chain® 5050C-15-250-0

chainflex® Types CF9,

additional hydraulic hoses

Location Worldwide More references Worldwide Running since 2006



### Bulk-handling crane trolley travel

Travel 735 ft. (224 m)

Speed max. 131.2 ft/min (40 m/min.)

Acceleration max. .66 ft/sec² (0.2 m/sec²)

e-chain® 4040CR-22-300-0 chainflex® Types CF11 / CF9 / CF34

Location China More references Worldwide



### Bulk-handling quay travel

Travel 639.8 ft. (195 m)
Speed max. 65.6 ft/min (20 m/min.)
Acceleration max. .66 ft/sec² (0.2 m/sec²)

e-chain® 5050CR-35-300-0 chainflex® Types CF300 / CF9 / CF11

Location Germany More references Europe, Asia

## More references...

## igus® e-chain systems® in crane applications...worldwide



### Ship-unloader crane

Travel 1446.9 ft. (441 m)
Speed max. 98.4 ft/min (30 m/min)
Acceleration max. .33 ft/sec² (0.1 m/sec²)
e-chain® 5050R-28-300-0
chainflex® Types CFCRANE
Location Asia
More references Europe, Canada

Running since 2002



### Ship-unloader crane

Running since

 Travel
 347.8 ft. (106 m)

 Speed max.
 787.4 ft/min (240 m/min)

 Acceleration max.
 1.97 ft/sec² (0.6 m/sec²)

 e-chain®
 5050RHD-12/15/12-300-0

 Location
 Europe

 More references
 Worldwide

2004

### Ship-unloader Crane

 Travel
 497.1 ft. (151.5 m)

 Speed max.
 984.3 ft/min (300 m/min.)

 Acceleration max.
 1.64 ft/sec² (0.5 m/sec²)

 e-chain®
 4040CR-15-250-0

 chainflex® Types
 CF12 / CF11 / CF9

 Location
 Canada

 More references
 Europe, Asia

Running since 1998



### Container crane

 Travel
 257.6 ft. (78.5 m)

 Speed max.
 393.7 ft/min (120 m/min)

 Acceleration max.
 1.64 ft/sec² (0.5 m/sec²)

 Cycles/year
 42.000

 e-chain®
 5050R-27-250-0

 chainflex® Types
 CF300 / CF11 / CF9

Location Europe
More references Worldwide
Running since 1999

# More references...

## igus® e-chain systems® in crane applications...worldwide



### Grab crane

Running since

Travel 377.3 ft. (115 m)

Speed max. 541.4 ft/min (165 m/min)

Acceleration max. 2.3 ft/sec² (0.7 m/sec²)

e-chain® 5050RHD-30-300-S10-0-E

Location Europe

More references Worldwide

2007



STS crane
Travel
Speed max.
Acceleration max.
e-chain®
chainflex® Types
Location
More references
Running since

65.6 ft. (20 m) 3.28 ft/min (1 m/min.) < 1.64 ft/sec² (0.5 m/sec²) 5050HD-25/25-500-0 CF300/CF9/CF10/CF11 USA Worldwide



### STS crane, low profile

Travel 269.0 ft. (82 m)

Speed max. 11.5 ft/s (3.5 m/s)

Acceleration max. e-chain® 3838CR-20-200-S10-0-E

chainflex® Types CF300 / CF10 / CF9 / CFLG

Location Europe

More references Worldwide

2007



2009

### STS crane

More references

Travel 301.9 ft. (92 m)
Speed max. 590.6 ft/min (180 m/min.)

Worldwide

e-chain® 4040CR-12-200 chainflex® Types CF9 / CF37 CF10 / CF11 Location Poland

Running since

# igus® North America



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