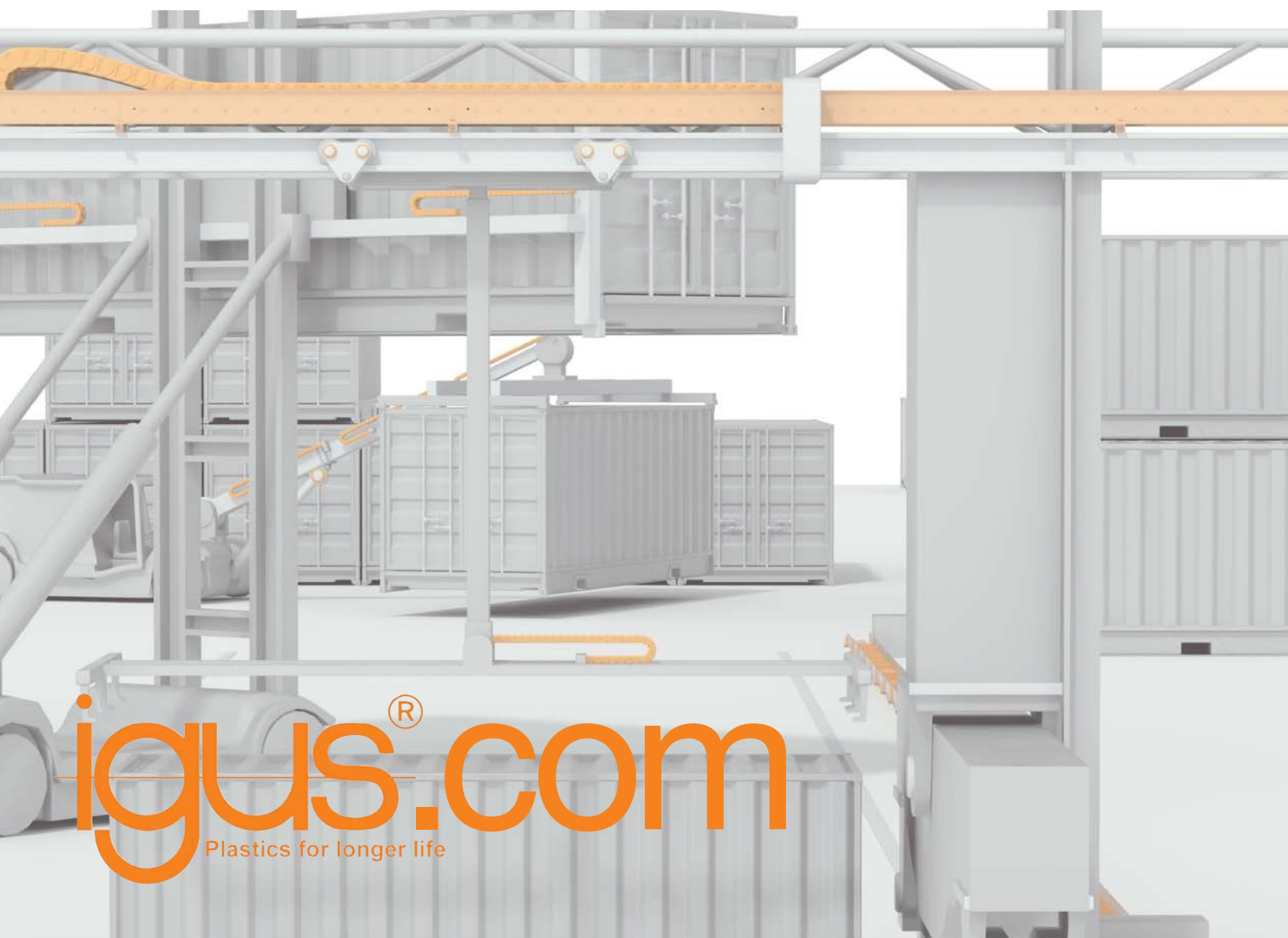


Energy Chain Systems® and Chainflex® Cables

Cranes & Offshore

Increase service life for cranes & offshore machinery with an Energy Chain System®



igus®.com
Plastics for longer life

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Energy Chains® for Cranes

Solutions for crane builders and users: Longer life at lower cost

igus® has been installing Energy Chain Systems® on all types of cranes for over a decade. Currently, there are more than 2,826 RTG/RMG cranes, over 400 STS cranes, 22 shipyard cranes and 11 bulk-handling cranes with Energy Chains® operating all over the world. igus® crane technology is evolving as quickly as the cranes themselves.

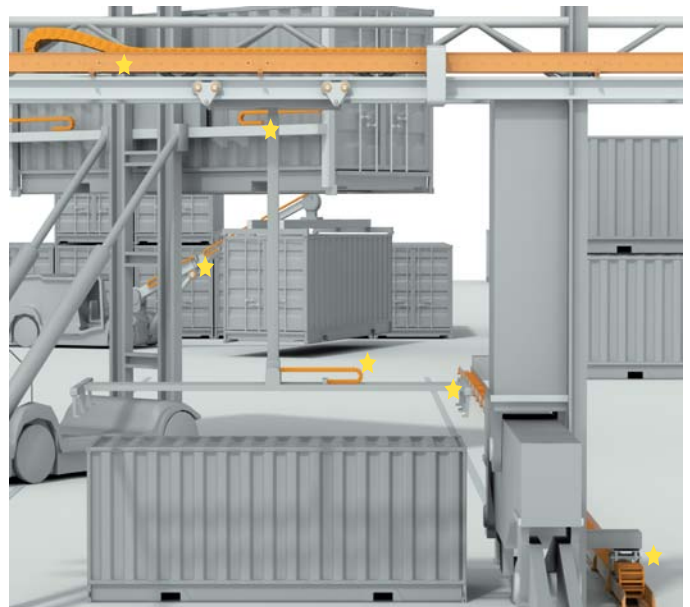
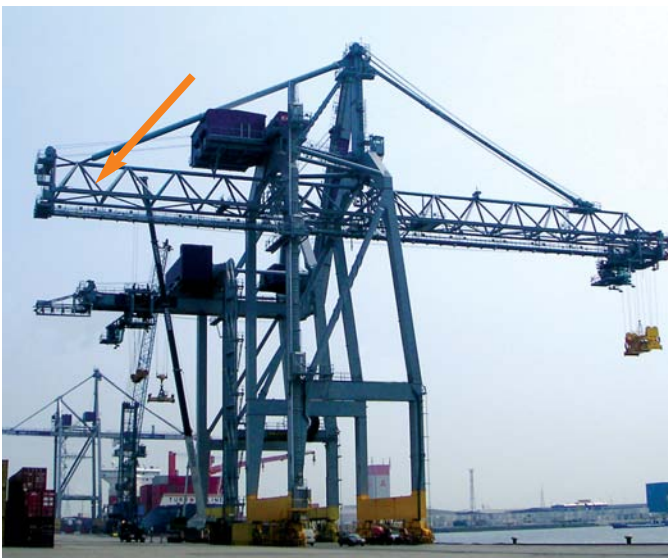
As the crane builders were spurred to go bigger and faster by their customers while maintaining reliability, older technologies such as standard festoons, cable reels and bus-bars were hard pressed to keep up. The industry needed a new solution and igus® has filled that need. igus® delivers a solution that not only gives crane builders confidence in their designs, but also provides trouble-free operation for years to come.

Our wealth of experience with different sizes and styles of cranes has helped us to develop standard solutions that work in the harshest environments and under the most demanding work loads.

igus® has also developed specialized parts to deal with common issues in the crane industry. Floating tow-arms can be used to accommodate imperfect girder straightness or trolley wandering. igus® developed rise protection as a safety measure for systems operating overhead and application specific solutions, such as a boom-break device, which enables a trough to re-align as it separates while the boom is lifted into the up position.

Features of Energy Chains® include:

- Speeds up to 1,968 ft/min possible
- Grab cranes and STS crane applications with 984 ft/min in use
- Space-saving design reduces length and height
- No additional drives or control system 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 optic)
- Fast assembly
- Possible travel up to 2,624 ft with igus® Rol-E-Chain® (applications with 1,640 ft on STS cranes travels currently in use)
- Possible reduction of cable length by 50 %
- No loop station required
- Overall steel structure can be shortened
- Approved on more than 2,500 RTG/RMG and 375 STS cranes



No loop station required – igus® Energy Chain system® on STS crane. System delivered as ReadyChain®: a complete, pre-harnessed cable carrier system.

Application Highlight

Company:

Virginia International Terminals (VIT) operates and maintains the waterfront Marine Terminals and Virginia Inland Port owned by The Virginia Port Authority. The second largest terminal, Portsmouth Marine Terminal (PMT), currently operates six cranes to handle containers, RO/RO and break-bulk cargo.

Application specifics:

One of these cranes is an old Paceco crane. More than 30 years old, it's a workhorse that just won't quit. However, the company was experiencing wind problems and roller and tow cable failures on all of its festoon systems. This prompted PMT to look for an alternate method of getting communications and power from the back reach of the crane to the operator's cab, which moves independently of the crane boom.

The best solution was a fully harnessed cable carrier system from igus®. PMT uses RoI-E-Chain®, an Energy Chain® cable carrier with integrated rollers to reduce friction, which houses Chainflex® continuous-flex cables on a trolley that moves 410 feet-per-minute. The Energy Chain® moves vertically as it glides on itself in a guide trough attached to the crane underneath and suspended in the air.



Mike Petty, Crane Maintenance Supervisor for VIT said, "Driven by our desire to minimize downtime on equipment, we are always looking for innovative ways to improve reliability. This is what led us to Igus ReadyChain systems. I need to be able to say I tested it and it works—100 percent. ReadyChain works. I am completely confident in this product. ReadyChain gives us higher reliability at a lower cost."

Company:

The Shanghai Waigaogiao Shipbuilding Company (SWS) is situated at the southern harbor of the Pudong district in Shanghai, just opposite the Changxingdao port district at the mouth of the Yangtze River. It uses igus® cable management systems on three of its ship-to-shore cranes.

Application specifics:

SWS has three shipyard cranes each equal in size to a 30-story high-rise building. Each one uses Energy Chain® cable carriers to guide and protect the machine's moving cables. The Energy Chains® – which carry loads of 66 pounds over distances of 590 feet – withstand the harsh winds, lashing rain and saltwater prevalent at the mouth of the Yangtze. The annual, two-month monsoon season leaves components at risk for corrosion, but due to their high-performance plastic construction, the Energy Chain Systems® operate problem-free. Even a typhoon two years ago did not shut down operations.

The two shipyard cranes, with lifting capacities of 600 to 800 tons, and the 32-ton material crane are supplied with energy and data via low-friction roller Energy Chains®, which run inside igus® guide troughs made of steel. These cable carriers are designed for high loads and long travels at high speeds. In ship-to-shore applications, travels up to 1,640 feet and speeds topping 19.7 feet-per-second have been achieved. When compared to a gliding Energy Chain®, the reduction of the thrust force is close to 75 percent.

One shipyard crane was equipped with an Energy Chain®, Chainflex® cables and an additional system component: 'Push-Pull Force Detection' system (PPDS) from igus®. 'PPDS' monitors the sliding forces of the Energy Chains® online in order to avoid system damage and failures through preventive maintenance or remote intervention. SWS saves on storage by not keeping any spare igus parts on-site. These parts can all be found in the 32,292 foot igus® warehouse in the free trade zone of Waigaoqiao, just 12 miles from the cranes' location.



Crane Application Examples

Examples of Energy Chain Systems® installed on cranes worldwide



Ship-unloader Crane

Travel 1,447 ft
 Speed max. 98 ft/min
 Acceleration max. .328 ft/sec²

Energy Chain® Cable Carrier:
 5050R-28-300-0
Chainflex® Cables:
 CFCRANE



Reach Stacker

Travel 26 ft
 Speed max. 49 ft/min
 Acceleration max. .82 ft/sec²

Energy Chain® Cable Carrier:
 4040-15-250-0



Bulk Material Crane

Travel 525 ft
 Speed max. 66 ft/min
 Acceleration max. 1.6 ft/sec²

Energy Chain® Cable Carrier:
 4140-22-250-0
Chainflex® Cables:
 CFF30 / CF7 / CF11



Ship-to-shore Crane

Travel 389 ft
 Speed max. 689 ft/min

Energy Chain® Cable Carrier:
 4040CR-22-250-0
Chainflex® Cables:
 CF300/CF9/CF10/CF1G



Container Crane

Travel 258 ft
 Speed max. 394 ft/min
 Acceleration max. 1.6 ft/sec²

Energy Chain® Cable Carrier:
 5050R-27-250-0
Chainflex® Cables:
 CF300 / CF11 / CF9



Indoor Crane

Travel 118 ft
 Speed max. 230 ft/min
 Acceleration max. 1.6 ft/sec²

Energy Chain® Cable Carrier:
 290-17-200-0
Chainflex® Cables:
 CF31 / CF6 / CF11



Mining Crane

Travel 33 ft
 Speed max. 20 ft/s
 Acceleration max. 1.6 ft/sec²

Energy Chain® Cable Carrier:
 600-35-300/4650-0
Chainflex® Cables:
 Power-, data- and control cables



RMG

Travel 1,211 ft
 Speed max. 394 ft/min
 Acceleration max. 1.3 ft/sec²

Energy Chain® Cable Carrier:
 4040R-31-250-0



Goliath Crane

Travel 404 ft
 Speed max. 131 ft/min
 Acceleration max. 1.6 ft/sec²

Energy Chain® Cable Carrier:
 40-15/15-250-0

Energy Chain® solutions for cranes around the world

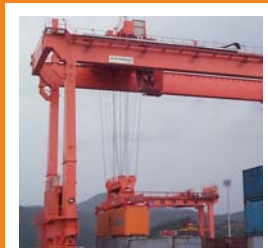
More than

2,000

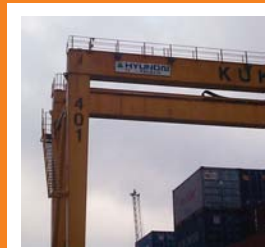
RTG/RMG cranes



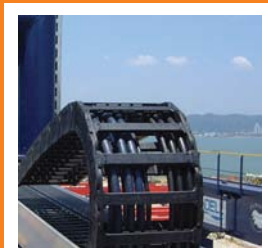
Rotterdam



Kwangyang



Pusan



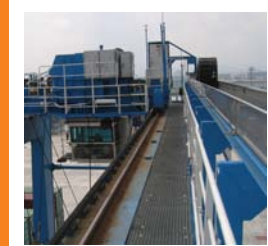
Istanbul



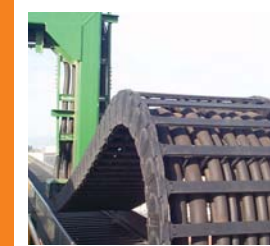
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Zwael



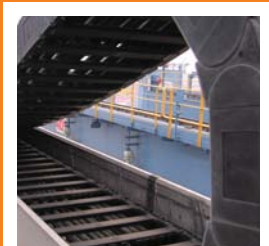
Yantian



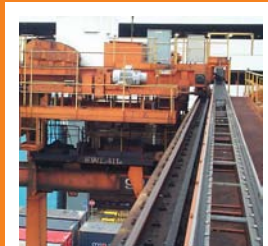
Oakland



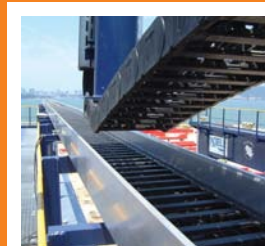
Yokohama



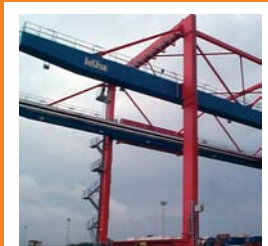
Istanbul



Hongkong



Panama



Hamburg

igus® has delivered longer life at lower cost for more than 2,000 RTG/RMG cranes. What's next? New generations of plastic Energy Chains®, new Chainflex® cables from fiber optic to 6/10 kV cables, and a standard condition-monitoring system. Use an Energy Chain System® to reduce costs and increase service life.

Energy Chains® for Offshore

igus® develops and manufactures plastic Energy Chain® cable carriers for all types of offshore applications. Energy Chains® are used on new and existing offshore automation tools, including:

- BOP transfer carts
- BOP cranes
- Pipe-handling systems
- Bridge-racking systems
- Iron roughnecks
- Top drives
- Load arms
- Gantry systems

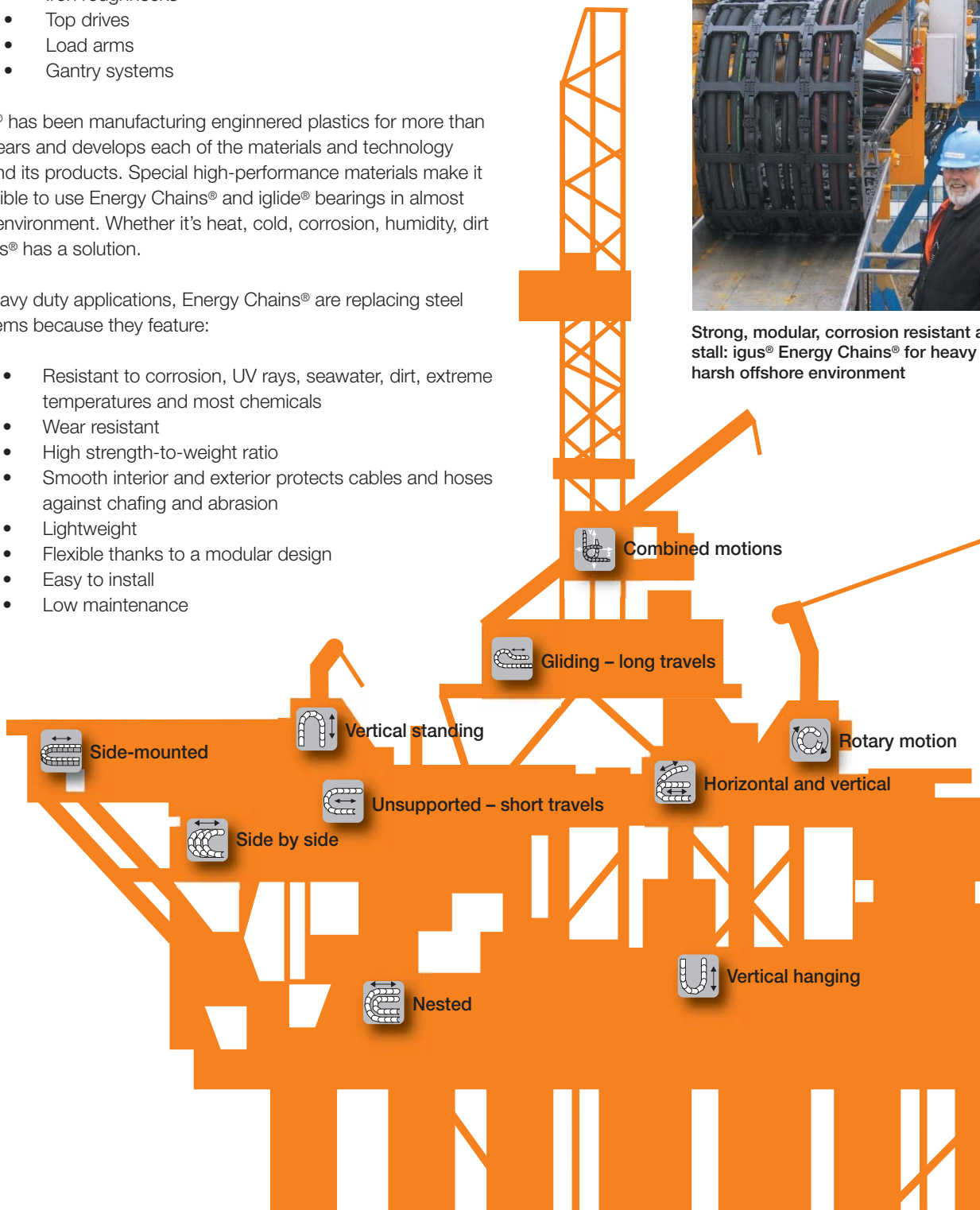
igus® has been manufacturing engineered plastics for more than 40 years and develops each of the materials and technology behind its products. Special high-performance materials make it possible to use Energy Chains® and iglide® bearings in almost any environment. Whether it's heat, cold, corrosion, humidity, dirt – igus® has a solution.

In heavy duty applications, Energy Chains® are replacing steel systems because they feature:

- Resistant to corrosion, UV rays, seawater, dirt, extreme temperatures and most chemicals
- Wear resistant
- High strength-to-weight ratio
- Smooth interior and exterior protects cables and hoses against chafing and abrasion
- Lightweight
- Flexible thanks to a modular design
- Easy to install
- Low maintenance



Strong, modular, corrosion resistant and easy to install: igus® Energy Chains® for heavy fill weights in harsh offshore environment



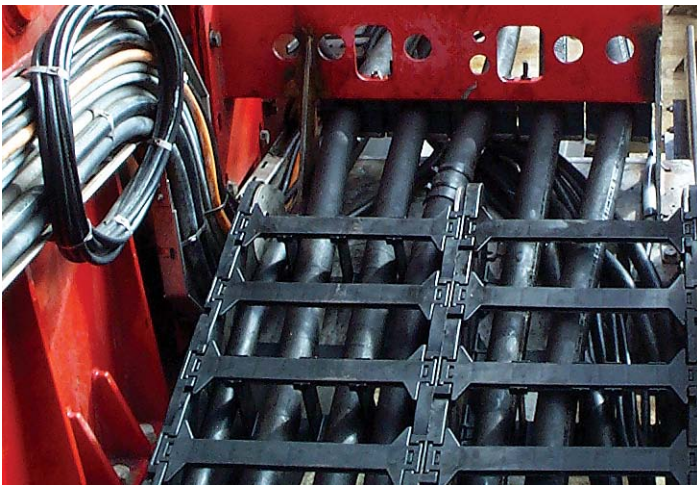
Offshore Application Examples



Lightweight and high stability: Short/cross travel application with Series E4/4 guided in a stainless steel guide trough



Rig skidding application in the Claymore, North Sea



Lightweight and high stability: Energy Chain® houses and protects hydraulic hoses



Vertical boom on a riser-handling crane for AKMH (West E Drill)



Low maintenance and long service life: Energy Chain® series 5050 with reverse bend radius on port crane equipment



Series 600 with extension link in igus® specially designed guiding channel in the Caspian Sea

igus® Project Engineering

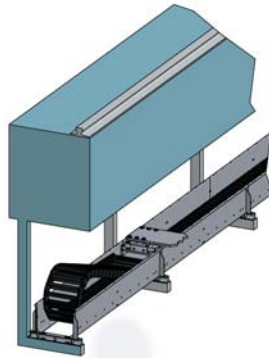
Project support – from design to after-sales service

Benefits:

- Specific application solutions using igus® standard products or special designs
- Assistance from the design process through the start of operation for every crane application
- After-sale service in 48 countries even after your guarantee expires
- All components are available for a minimum of another 10 years after delivery
- Most products available from stock



igus® project drawings developed in cooperation with the customer



Customized 3D sketch



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

Customized Products

Special parts that ensure Energy Chain Systems® run properly



Floating moving arm on "ship-to-shore" crane compensates for lateral mismatch between trolley traveling path, crane traveling path and the pre-harnessed cable carrier systems. Electronic push-pull force control with nominal/actual parameter check and emergency stop function optional.



To make sure the boom and the girder sides of the crane are connected without misalignment of the guide trough, igus® developed a special fixing for the swivel point. This means that the carrier can run on top, beside or below the crane girder.



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

igus® Testing

Proven product features guarantee long life



Climate tests for Energy Chains® and Chainflex® cables in temperatures from -40° F up to +390°F



This flagship application, to test long travel applications up to 410 ft and speeds of up to 984 ft/min., has been running for 4 years



igus® continuously conducts tests in its in-house laboratory under real conditions

Condition Monitoring PPDS

Push-Pull Force Detection System (PPDS) in full and easy versions

Benefits:

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

Typical crane applications:

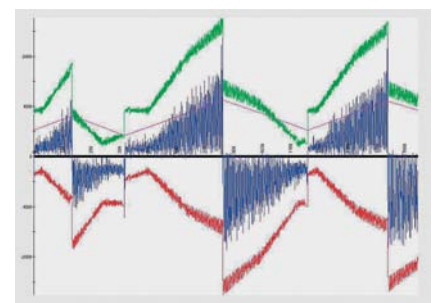
- STS
- Goliath cranes
- RMGs
- Indoor cranes
- Bulk handling cranes

Full PPDS System:

- **Data input**
Nominal/actual comparison of force value at the tow arm, measured four times-per-second, relative to the position of the Energy Chain System®.
- **Data exchange options**
Malfunction alerts as defined through SMS, e-mail or fax. Remote data exchange online or through e-mail.
- **Data log**
System data logout for up to three months with a 128 MB memory chip. Alternatively, incident-driven logout through modem memory is available.



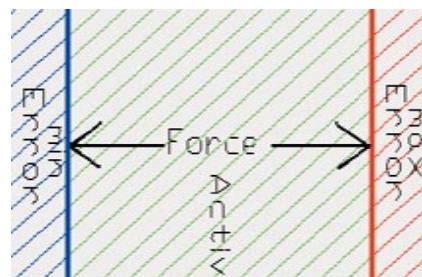
Push-pull-force monitoring with the PPDS System



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 real force on moving end.
- **Data exchange**
Emergency shut-down of the system when it exceeds optional limit values.
- **Data log**
Data log for up to 40,000 entries.



Easy PPDS – continuous real force measurement and limit comparison



Easy PPDS integrated in the floating moving arm

What Energy Chain[®] to Use When

Typical uses for cable carriers on cranes and offshore platforms



E4/4 Energy Chain[®]

- Sidemounted applications
- Dirty environments
- Underwater environments
- Typical crane applications: STS, goliath cranes, RTGs, RGMs, indoor and bulk handling cranes



Rol-E-Chain

- Long travel lengths
- High speeds
- Heavy fill weights
- Typical crane applications: STS, goliath cranes, indoor, bulk handling cranes and mining cranes



E4HD Energy Chain[®]

- Extremely long travels
- High Speeds
- Heavy fill weights
- High-particulate environments
- Typical crane applications: STS, goliath cranes, indoor, bulk handling cranes and mining cranes



P4 Energy Chain[®]

- High speeds up to 32 feet per second
- Heavy loads up to 20 pounds per foot
- Travel lengths up to 2,600+ feet
- Typical crane applications: For the most extreme crane applications, see igus for more information

Energy Chain Systems® E4/4

Energy Chain® family for cranes available in gliding and rolling version

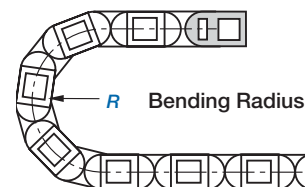


Features & Benefits

- 1 Pivoting or locking KMA mounting brackets with attachment capability on all sides
- 2 Overlapping tongue and groove design for high side-mount stability
- 3 Hinged, snap-open, removable lids along the outer radius of Energy Tube
- 4 Lateral glide surfaces for side-mounted operation
- 5 High torsion stability
- 6 Closed and open designs available and can be combined
- 7 Crossbars are removable along both radii for easy installation and maintenance
- 8 Wide, rounded crossbars that will not damage cables
- 9 Double lock for security

Typical crane applications:
STS, goliath cranes, RTGs,
RMGs, indoor cranes and
bulk handling cranes

Bending radius



Series	Inner height h_i		Inner width B_i		Outer width B_a		Outer height h_a		Bending radius R	
	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
2828	1.25	(32)	1.97 - 15.75	(50 - 400)	2.87 - 16.65	(73 - 423)	2.12	(54)	2.48 - 11.81	(63 - 300)
3838	1.65	(42)	1.97 - 15.75	(50 - 400)	3.03 - 16.81	(77 - 427)	2.52	(64)	2.95 - 13.78	(75 - 350)
4040	2.20	(56)	1.97 - 23.62	(50 - 600)	3.39 - 25.04	(86 - 636)	3.31	(84)	5.31 - 19.69	(135 - 500)
5050	3.15	(80)	1.97 - 23.62	(50 - 600)	3.94 - 25.59	(100 - 650)	4.25	(108)	5.91 - 39.37	(150 - 1000)

Rol-E-Chain Series

Reduce drive power by more than 75%

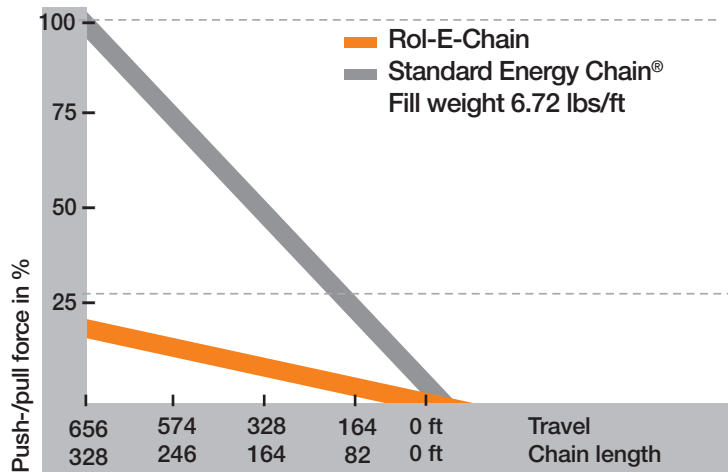
8 Benefits of the Rol-E-Chains:

1. Drive power required to move the cable carrier is reduced by more than 75%
2. Rollers with stainless steel roller bearings are standard
3. Travels up to 2,625 ft possible
4. Speeds up to 1,969 ft/min possible
5. Different types of rollers for optimum results in various situations
6. Rolling resistance for dirty applications
7. Ready-to-fit, made-to-specifications system
8. System guarantee for made-to-specifications system (depends on application)

Rol-E-Chain rolls, not glides:

Rol-E-Chain cable carriers have a unique design: built-in wheels to facilitate travel over long distances, such as on a crane. The wheels are integrated into the cable carriers side links and reduce friction dramatically, which makes longer travel, heavier load and faster speed applications possible.

A new-found need to expand the technical limits of cable carriers was behind the development of Rol-E-Chain. Rol-E-Chain is suitable for applications involving harsh environmental conditions, which makes it ideal for applications on cranes, material handling devices, plasma cutters and high-speed transfer systems.

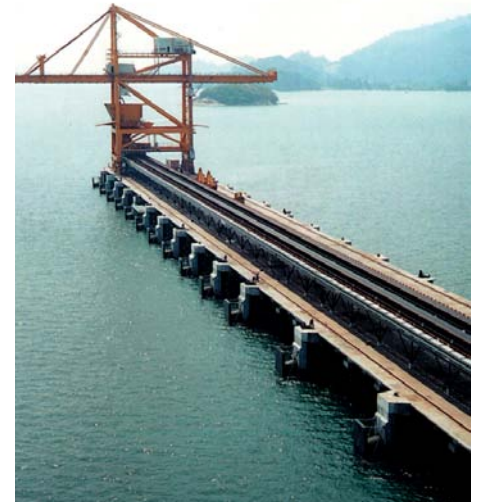


Comparison of the power requirement between Rol-E-Chain and a standard Energy Chain®

Series	Inner height h_i		Inner width B_i		Bending radius R	
	in.	(mm)	in.	(mm)	in.	(mm)
2828R	1.26	(32)	1.97 - 15.75	(50 - 400)	4.92 - 11.81	(125 - 300)
3838R	1.65	(42)	1.97 - 15.75	(50 - 400)	5.91 - 13.78	(150 - 350)
4040R	2.20	(56)	1.97 - 23.62	(50 - 600)	7.87 - 19.69	(200 - 500)
5050R	3.15	(80)	1.97 - 23.62	(50 - 600)	9.84 - 19.69	(250 - 500)
4040RHD	2.20	(56)	1.97 - 23.62	(50 - 600)	7.87 - 19.69	(200 - 500)
5050RHD	3.15	(80)	1.97 - 23.62	(50 - 600)	9.84 - 19.69	(250 - 500)



Higher fill weights are possible with Rol-E-Chain extension links



Drive power was reduced by 75% on this crane with a travel distance of 1,447 ft



Test rig for lifetime testing

Energy Chain[®] Heavy Duty Series

Energy Chains[®] for the toughest crane applications



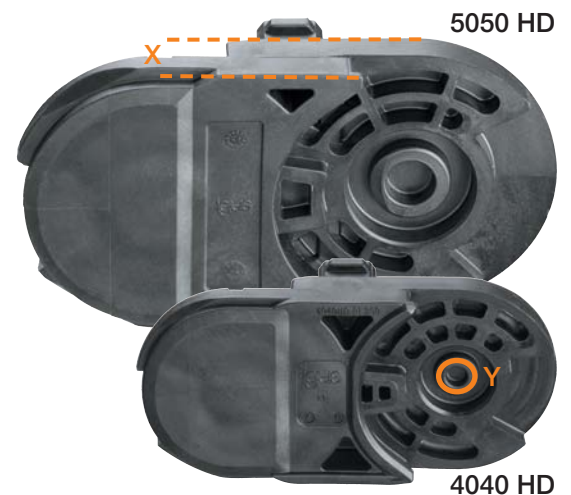
Features & Benefits

- 1 Crossbars are removable along both radii for easy installation and maintenance
- 2 Expanded gliding surface, expanded stop-dog surface and bigger pin/bore surface than classic E4/4 Series
- 3 Hinged, snap-open, removable lids along the outer radius of Energy Tube; closed and open designs available and can be combined
- 4 Double lock for security
- 5 Wide, rounded crossbars that will not damage cables
- 6 Lateral glide surfaces for side-mounted operation
- 7 High torsion stability

igus[®] series of heavy duty cable carriers are ideal for:

- High cable loads
- High speeds
- Long travel lengths
- Extreme environmental conditions

The improved E4/4 heavy duty takes cable carrier standards to new levels. Strength and cycle life are improved by significantly increased gliding and load-bearing surfaces. E4/4 HD can handle higher push/pull forces with the same inner dimensions as regular E4/4 series.



5050 HD to classic 5050:
Y: +120%, X: +7.5 mm

4040 HD to classic 4040:
Y: +140%, X: +9 mm

Typical crane applications:
STS, goliath cranes, indoor cranes, bulk handling cranes and mining cranes

Available from stock for the HD series:

- Roller glide to reduce tensile/shear forces
- Extension links for large widths and increased load capacity
- Interior separators to prevent cables from chaffing or twisting
- Mounting brackets that fasten at the fixed and moving ends of the chain

Series	Inner height h_i		Inner width B_i		Outer width B_a		Outer height h_a		Bending radius R		With Rollers
	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	
4040HD	2.20	(56)	1.97 - 23.62	(50 - 600)	4.09 - 26.14	(104 - 664)	3.31	(84)	5.31 - 19.69	(135 - 500)	4040RHD
5050HD	3.15	(80)	1.97 - 23.62	(50 - 600)	4.33 - 25.98	(110 - 660)	4.25	(108)	5.91 - 39.37	(150 - 1000)	5050RHD

Energy Chain System[®] P4

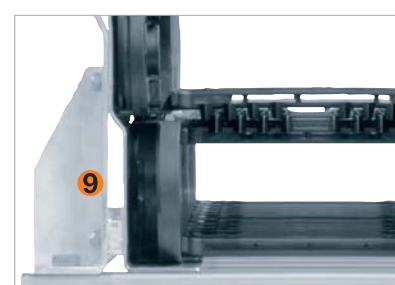
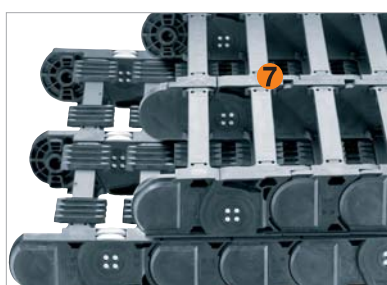
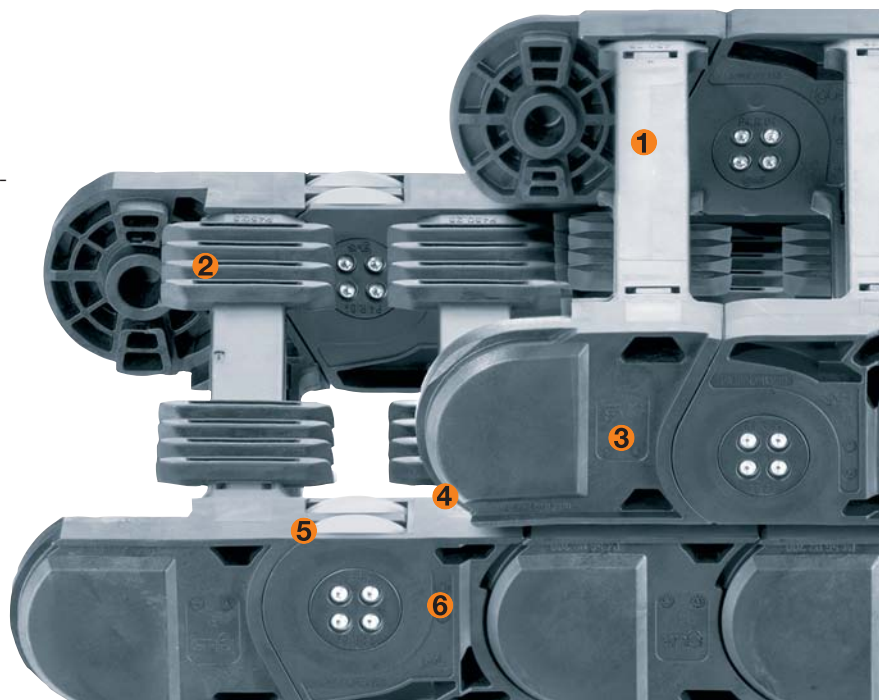
For very high fill weight and speeds

Safe, low-noise and abrasion-resistant cable carrier for long travels

With the low-maintenance System P4, a secure energy supply system can be used in long travels up to 2,625 ft (800 m) for cranes or conveyor systems. The upper run and lower run roll staggered on each other so the tribo-optimized plastic rollers don't overrun. Instead, they roll on a wide, continuous smooth surface. System P4 is safely guided by the AUTO-GLIDE crossbars and a special trough system. **Ideal for applications with high travel speeds up to 32.8 ft/s (10 m/s) and large fill weights up to 20 lbs/ft (30 kg/m).**

Features & Benefits

- 1 4 different inner heights
- 2 Comb style AUTO-GLIDE crossbars
- 3 Low maintenance RoI-E-Chain System from tribo-optimized plastic rollers
- 4 Offset motion of upper and lower run
- 5 Exceptionally quiet through special roller and link design
- 6 Same pitch for roller- / chain links
- 7 Extension link solution for even higher fill weights
- 8 Robust steel mounting brackets available
- 9 Special P4 trough system available



- Extension link for heavy fill weights
- 4 inner heights available
- 50% higher fill weight possible
- Maximum rigidity
- Divides cross section into separate compartments (electric/hydraulic)

- New tribo-optimized plastic rollers
- Wear resistant
- Long service life
- Improved rolling feature
- Lower noise and vibration
- Same pitch for roller links / chain links

- New guide trough system
- Special geometry in combination with AUTO-GLIDE cross bars enables offset of upper and lower run
- Stainless trough segments resist corrosion and sea water

Series	Inner height		Inner width		Outer width		Outer height		Bending radius	
	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
P4-32	1.26	(32)	3.94-9.84	(100-250)	5.20-11.10	(132-282)	2.13	(54)	2.95-11.81	(075-300)
P4-42	1.65	(42)	3.94-9.84	(100-250)	6.06-11.97	(154-304)	2.52	(64)	3.94-13.78	(100-350)
P4-56	2.20	(56)	7.87-15.75	(200-400)	10.63-18.50	(270-470)	3.31	(84)	5.91-19.69	(150-500)
P4-80	3.15	(80)	7.87-15.75	(200-400)	10.87-18.74	(276-476)	4.25	(108)	5.91-19.69	(150-500)

Ready to Connect: ReadyChain[®] harnessing services

Reduce storage costs to zero with cables, Energy Chains[®] and connectors

Eliminate the need for storage thanks to our rapid and guaranteed delivery times.

Cut throughput time by up to 50%

igus[®] has the ability to deliver readymade systems within 2-8 days on a guaranteed date almost anywhere in the world.

Minimize machine downtime

Play it safe, it's the little things that always cause problems. Receive a complete solution delivered into your hands and eliminate buying parts from multiple suppliers.

ReadyChain also enables you to:

- Reduce the number of suppliers and orders by up to 75% with one invoice, one order;
- Increase production throughput;
- Improve delivery lead times to customers;
- Reduce inventory and procurement costs;
- Enjoy the benefits of a complete system guarantee;
- Use manufacturing floor space more efficiently; and
- Improve speed to market



ReadyChain[®] installation on a bulkhandling crane. ReadyChain[®] system, including cable carriers and cables, weighs more than two tons.

Chainflex® Cables for Cranes

More than 750 sizes and styles from stock

igus® offers more than 750 Chainflex® cables from stock, specially designed for use in Energy Chain® cable carriers.

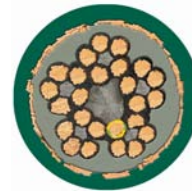
New continuous-flex cables for demanding applications on cranes and for plant engineering.

- TPE, UV-resistant outer jacket
- PVC- and halogen-free
- Resistant to oil and bio-oil
- Suitable for low temperatures
- Nominal voltage 0.6/1kV
- Bending radius inside Energy Chain®: 7.5 x d

igus® Chainflex® – power cable



igus® Chainflex® – control cable



Single-conductor CF330-D and CF340 power cables



Part No.	Cable Type	Specially Developed for	Shielded	Nominal Voltage	Temperature Range	Number of Conductors	Cross Section mm²	Certifications
CF330-D	TPE	Outdoor	No	600/1000V	-31°F to +194°F	1	6 - 185	
CF340	TPE	Outdoor	Yes	600/1000V	-31°F to +194°F	1	4 - 185	

Halogen-free CF37-D and CF38 power cables



Part No.	Cable Type	Specially Developed for	Shielded	Nominal Voltage	Temperature Range	Number of Conductors	Cross Section mm²	Certifications
CF37-D	TPE	Outdoor	No	600/1000V	-31°F to +194°F	3 - 5	1.5 - 50	
CF38	TPE	Outdoor	Yes	600/1000V	-31°F to +194°F	3 - 4	0.5 - 50	

Chainflex® Cables for Cranes

Four-conductor power cables

Shielded power cable for converter operation up to 600/1000 V. and up to 70 mm².*



Part No.	Cable Type	Specially Developed for	Shielded	Nominal Voltage	Temperature Range	Number of Conductors	Cross Section mm ²	Certifications
CF30	PVC	Indoor	No	600/1000V	23°F to +158°F	4 - 5	1.5 - 50 mm ²	CE SP RU
CF31	PVC	Indoor	Yes	600/1000V	23°F to +158°F	4 - 5	1.5 - 70 mm ²	CE SP RU
CF34-UL-D	TPE	Outdoor	No	600/1000V	-31°F to +194°F	3 - 5	1.5 - 50 mm ²	CE SP RU
CF35-UL	TPE	Outdoor	Yes	600/1000V	-31°F to +194°F	3 - 4	05 - 50 mm ²	CE SP RU

Single-core power cables

Shielded and unshielded single-conductor power cables for the most demanding applications.



Part No.	Cable Type	Specially Developed for	Shielded	Nominal Voltage	Temperature Range	Number of Conductors	Cross Section mm ²	Certifications
CF300-UL-D	TPE	Indoor & Outdoor	No	600/1000V	-31°F to +194°F	1	4 - 185 mm ²	CE SP RU
CF310-UL	TPE	Indoor & Outdoor	Yes	600/1000V	-31°F to +194°F	1	4 - 185 mm ²	CE SP RU

Fiber optic cables

Fiber glass (62.5/125 or 50/125), 2, 6 or 12 fibers – cables are tested over millions of cycles.



Part No.	Cable Type	Specially Developed for	Shielded	Nominal Voltage	Temperature Range	Number of Conductors	Cross Section mm ²	Certifications
CFLG-G LWL 50/125	TPE	Indoor & Outdoor	No	600/1000V	-40°F to +194°F	6/12*	50/125 μm	CE
CFLG-G LWL 62.5/125	TPE	Indoor & Outdoor	No	600/1000V	-40°F to +194°F	6/12*	62.5/125 μm	CE

* Other numbers of conductors/fibers on request

Chainflex® Cables for Cranes

Single-conductor CF Crane

Shielded, highly flexible single-conductor cable for up to 6/10kV in demanding applications on cranes and heavy machinery. Cross sections: 1 x 25/16 to 1 x 95/16.



Part No.	Cable Type	Specially Developed for	Shielded	Nominal Voltage	Temperature Range	Number of Conductors	Cross Section mm ²	Certifications
CFCRANE	iguprene	Outdoor	Yes	6/10 kV	-4 °F to +176°F	1	25 - 95 mm ²	CE

Data cables

Available for continuous data systems.

Also available in big cross sections, for example 3 x 2 x 2.5 mm² or with voltage supply conductors.



Part No.	Cable Type	Specially Developed for	Shielded	Nominal Voltage	Temperature Range	Number of Conductors	Cross Section mm ²	Certifications
CF211	PVC	Indoor	Yes	300/300 V	23°F to +158°F	2 - 28	0.25 - 0.5 mm ²	CE SP RU
CF240	PVC	Indoor	Yes	300/300 V	23°F to +158°F	3 - 24	0.14 - 0.34 mm ²	CE SP RU
CF11	TPE	Indoor & Outdoor	Yes	300/300 V	-31°F to +212°F	4 - 36	0.14 - 2.5 mm ²	CE SP RU

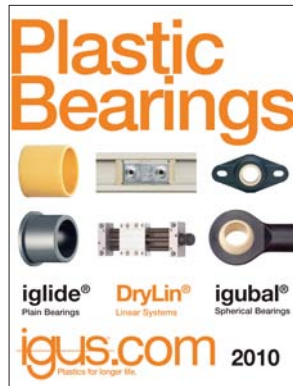
Control cables

PVC, TPE cables for a wide range of applications, shielded and unshielded and with a large number of cross sections and conductors. See main catalog for PUR control cables.



Part No.	Cable Type	Specially Developed for	Shielded	Nominal Voltage	Temperature Range	Number of Conductors	Cross Section mm ²	Certifications
CF5	PVC	Indoor	No	300/500 V	23°F to +158°F	2 - 42	0.25 - 6.0 mm ²	CE SP RU
CF6	PVC	Indoor	Yes	300/500 V	23°F to +158°F	3 - 25	0.25 - 2.5 mm ²	CE SP RU
CF9	TPE	Indoor & Outdoor	No	300/500 V**	-31°F to +212°F	2 - 36	0.25 - 35.0 mm ²	CE
**CF9-25-18 (18x2.5 mm ²) at 600/100V cable also available.								
CF10	TPE	Indoor & Outdoor	Yes	300/500 V	-31°F to +212°F	2 - 25	0.14 - 4.0 mm ²	CE

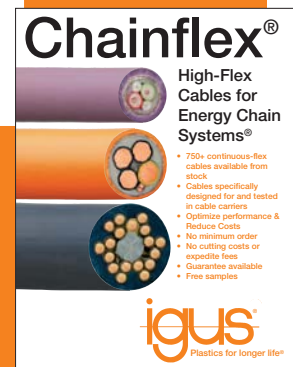
Also from igus®



The iglide® catalog contains information about igus®' extensive line of plastic plain bearings, spherical bearings and linear bearings and slides. With more than 12 specially engineered polymer blends, there is an iglide® bearing for every application. More than 9,600 sizes and styles are available from stock.



The Energy Chain Systems® catalog provides comprehensive technical data and design information about hundreds of cable carriers and cable products. The new catalog has been revamped so products can be located quickly and easily. Various on-site services and harnessing solutions are available, and all products are backed by a full system warranty.



The Chainflex® catalog contains more than 750 sizes and styles of continuous-flex cables, as well as design information and strain relief options. Chainflex® cables are designed for use in Energy Chain Systems®. The range includes control, data, bus, position feedback, fiber optic, coax, servo, power and robot cables. igus® also offers custom cables, as well as pre-harnessed cables for drive technology.



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