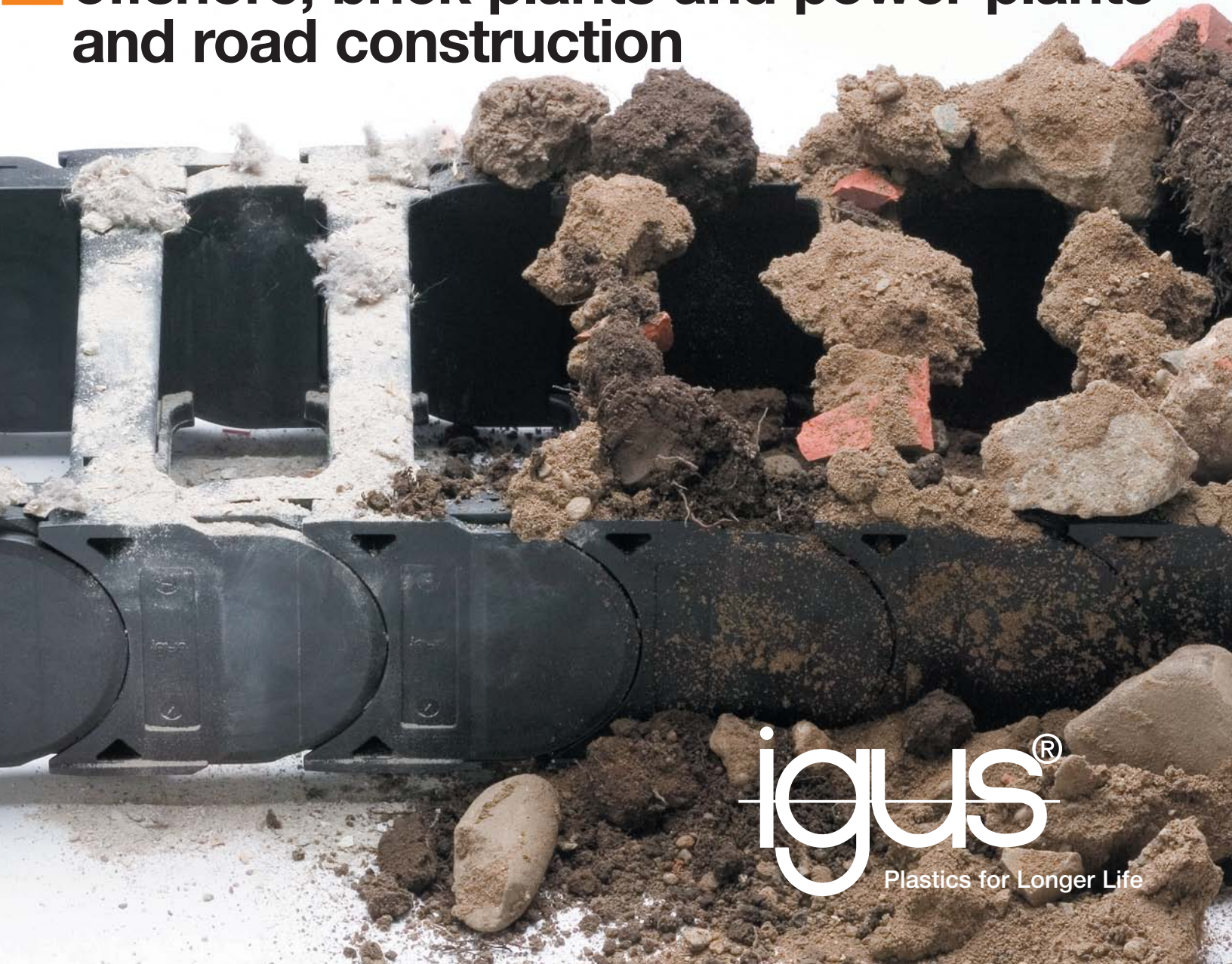


igus® Energy Chains® for steel mills, ...

# heavy duty plastic

offshore, brick plants and power plants  
and road construction



igus®  
Plastics for Longer Life



# Over 40 years of experience

Igus® Inc. is a leading expert in plastic technology with more than 40 years experience developing complex polymer blends. These specially designed, high-performance polymers enable Energy Chain® cable carriers to be used in virtually any application. Whether the conditions are humidity, dirt, debris or extreme temperatures, igus has an Energy Chain® solution for every environment and every one is metal-free to prevent corrosion. Igus Energy Chains® replace steel systems every day in heavy-duty applications based on their advantageous features and benefits.

- Steelworks
- Offshore applications
- Construction material manufacturing
- Ship-to-shore cranes
- Off-highway equipment
- Composting facilities
- Power plants
- Waste management facilities
- Many more

Tell us your unique application needs and we will provide a solution to meet them

- Corrosion free
- Lightweight but high stability
- Cost effective modular design
- TÜV certified
- Long lifespan
- Little to no maintenance
- Resistant to dirt, chemicals and extreme temperatures
- Tested and proven materials with igus® complete system guarantee

These are just a few of the features that we can incorporate into the design of your heavy-duty cable carrier system. Call igus® and get a free design consultation from one of our cable carrier experts to discover which solution is right for you.

# Brick plants



High amounts of brick dust create a demanding environment.

Industry:	Handling in brickworks
Energy Chain®:	5050-40-200-0
Travel length:	65.6 ft
Speed:	3.28 ft/s
Acceleration:	3.28 ft/s <sup>2</sup>
Fill weight:	ca. 4.70 lbs/ft

Despite highly abrasive brick dust, the Energy Chain® has been operating for 5 years filled with various cables including Chainflex® CF9. Temperatures range up to 122° F and the plant operates 200,000 hours/year



# Road construction



Debris from construction materials creates an extremely hazardous environment.



Industry:	Road construction
Energy Chain®:	2x 48-075-100-0
Travel length:	46 ft
Speed:	3.28 ft/s
Acceleration:	3.28 ft/s <sup>2</sup>
Fill weight:	.54 lbs/ft

An asphalt finisher applies hot and cold bitumen mixtures. The Energy Chain® supplies power to the front end of the vehicle and is exposed to extreme dirt and debris accumulation.



# High additional loads



High additional loads are placed on the carrier due to high number of hoses and cables.

Industry: Vacuum-heat treatment  
Energy Chain®: 600-35/640-26/640-21/600-32-500-0-LT-LW  
Travel length: 61.7 ft  
Speed: 52.5 ft/min  
Acceleration:  $3.28 \text{ m/s}^2$   
Fill weight: ca. 40 lbs/ft

Energy Chain® guides the supply cables of a quenching chamber, which feeds the attached vacuum oven.



# Power Plants



Energy Chain® delivers highly reliable operation despite extreme contamination.



Industry:	Waste management cranes
Energy Chain®:	5050R-40-250-S10.0
Travel length:	306.7 ft
Speed:	4.92 m/s
Acceleration:	1.64 m/s <sup>2</sup>
Fill weight:	88.2 lbs/ft

Two opposed Energy Chains® inside the waste-fed power plant, supply power to the cranes in extremely abrasive debris.

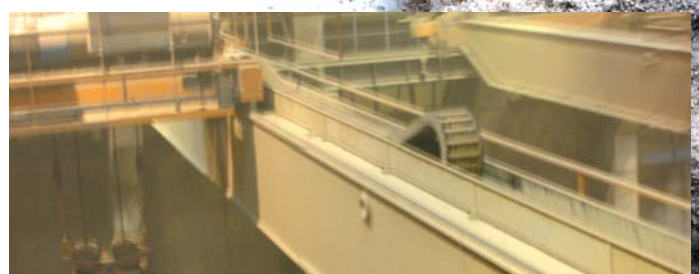


# Refuse incineration plants



Refuse incinerator plant encounters caustic substances and still performs flawlessly.

Industry: Waste management crane  
Energy Chain®: 5050R-35-350-S10-0-E (Crane drive)  
5050R-27-350-S10-0-E (Trolley drive)  
Travel length: Crane: 170.6 ft, Trolley: 70.5 ft  
Speed: Crane: 4.36 m/s, Trolley: 4.36 m/s  
Acceleration: 3.28 m/s<sup>2</sup>  
Fill weight: Crane: 10 lbs/ft, Trolley: 9.48 lbs/ft  
Debris accumulates quickly in the crane system of a waste incinerator.



# Tunneling



A tunnel drilling machine gets its power through an Energy Chain®.

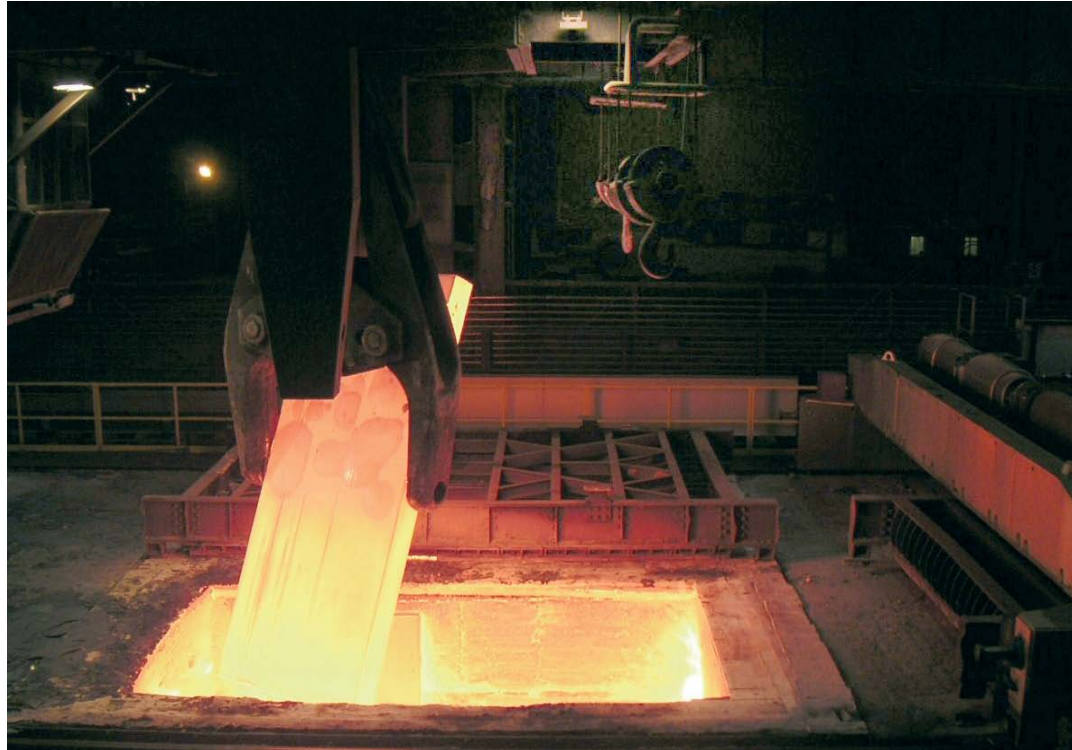


Industry:	Tunnel construction
Energy Chain®:	840-30-450-0
Travel length:	46 ft
Speed:	slow
Acceleration:	slow
Fill weight:	approximately 5.71 lbs/ft

An Energy Chain System® guides the hose lines to a tunnel drilling machine.



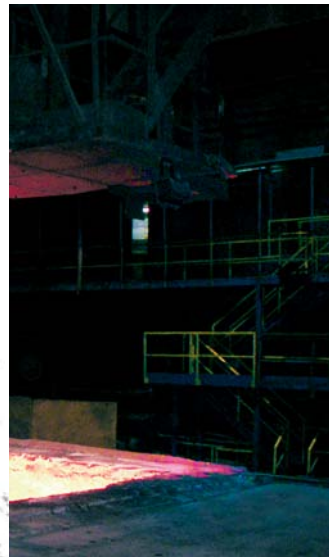
# Steel mills



A Long travel application in a high-temperature environment.

Industry: Steel industry  
Energy Chain®: 4040CR  
Travel length: 324.8 ft  
Speed: 7.09 m/s  
Acceleration: 1.18m/s<sup>2</sup>  
Fill weight: 3.98 lbs/ft

Four-meter-long steel slabs are heated in temperatures up to 1,200 °C in the pit furnaces. The surrounding equipment is exposed to heat and flames.



# Waste handling



Inspectors examine the Energy Chain® in a waste management plant.



Industry:	Waste management
Energy Chain®:	5050R-27-300-S10-0 (Trolley drive) 5050R-35-350-S10-0 (Crane drive)
Travel length:	69.9 ft / 170.6 ft
Speed:	4.36 ft/s
Acceleration:	.82 ft/s <sup>2</sup>
Fill weight:	9.74 lbs/ft

Severe contamination with high metal content is encountered by bridge and runway travel carriers. The bridge travels in opposing directions.

# Power plant



igus® Rol-E-Chain operates in a power plant.

Industry: Thermic waste utilization  
Energy Chain®: 4040CR-26-200-0 (Crane drive)  
4040CR-20-200-0 (Trolley drive)  
Travel length: 151 ft  
Speed: 4.92 ft/s  
Acceleration: .66 ft/s<sup>2</sup>  
Filling per m: 4.97 lbs/ft

Amid large amounts of debris, an Energy Chain® operates in a bridge and runway travel.



# Coal-burning power plants



Supply of the bucket-wheel reclaimers using igus® Energy Chains®



Industry: Coal-burning power plant  
Energy Chain®: Rol-E-Chain® 4040CR-20-350-0  
Travel length: ca. 591 ft  
Speed: 1.64 ft/s  
Acceleration: .065 ft/s<sup>2</sup>  
Fill weight: 6.32 lbs/ft

Coal is used to supply power to two plants. For more than a year and a half, Energy Chain® has enabled the transfer of coal to the furnace with no problems.

# Offshore industry



Energy Chains® handle high loads with ease in a challenging offshore application.

Industry: Offshore  
Energy Chain®: 601-20/20/50-500  
Travel length: 39 ft  
Speed: 3.28 ft/s  
Acceleration: 9.8 ft/s<sup>2</sup>  
Fill weight: 33.6 lbs/ft

An Energy Chain® with a center-strap design is used for high stability. High-pressure hydraulic hoses and power cables are used in this extreme weather environment; but this carrier delivers consistently.



# Offshore industry



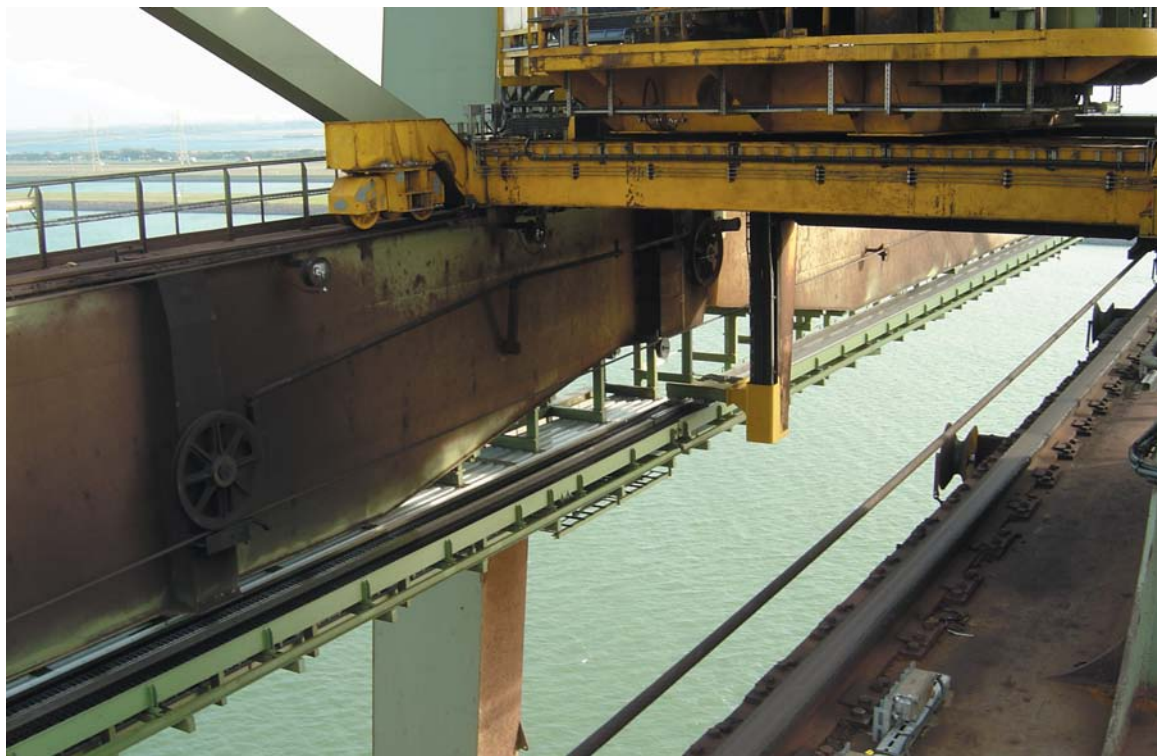
A pipe handling application protects its power supply with Energy Chain®.



Industry: Offshore  
Energy Chain®: 4040-37-200  
Travel length: 42 ft  
Speed: 6.56 ft/s  
Acceleration: 9.84 ft/s<sup>2</sup>  
Fill weight: 10.7 lbs/ft

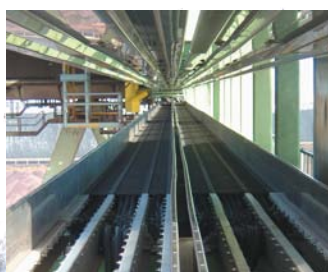
Energy Chain® ensures high stability and reliability in pipe handling.

# Ship unloaders



A fully harnessed system on a ship unloader is provided by igus®

Industry: Ship to shore crane  
Energy Chain®: 2 x Heavy Duty Rol-E-Chain  
5050RHD-12/18/12-300-0  
Travel length: ca. 348 ft  
Speed: 13 ft/s  
Acceleration: 2.62 ft/s<sup>2</sup>  
Fill weight: approximately 16.8 lbs/ft on each Chain  
Two Energy Chain Systems® supply energy to the bridge. All components, installation and maintenance are delivered by igus®.



# Coal handling



A Rol-E-Chain System with a 190 m travel length is installed in a coal burning power plant.



Industry: Coal-burning power plant  
Energy Chain®: Rol-E-Chain® 4040CR-25-350-0  
Travel length: ca. 623 ft  
Speed: 1.64 ft/s  
Acceleration: .08 ft/s<sup>2</sup>  
Fill weight: 5.41 lbs/ft

The Energy Chain System® for a coal-handling application has been in operation for three years with no problems.



# Dusty environment



A plastic carrier performs flawlessly in a steel plant.

Industry: Steel plant  
Energy Chain®: 4040CR-25-250-H20-0  
Travel length: 34 ft  
Speed: 3.28 ft/s  
Acceleration: 3.28 m/s<sup>2</sup>  
Fill weight: 4.09 lbs/ft

An extremely harsh environment with dirt and dust, high loads, long travel and high temperature, is no match for this Energy Chain® that has been operating since 2003.



# Mining industry



A rotary application on a bucket-wheel excavator uses an Energy Chain System®.



Industry: Mining industry  
Energy Chain®: 600-35-300/4650-0  
Travel length: 32.8 ft  
Speed: .33 ft/s  
Acceleration: 1.64 ft/s<sup>2</sup>

An Energy Chain® is installed on the slewing gear of a bucket-wheel reclaimer.

# Brown coal industry



The bucket is turned 180° with the help of an igus® Energy Chain System®.

Industry: Power plant  
Energy Chain®: 5050-51-500-0  
Travel length: 32.8 ft  
Speed: .92 ft/s  
Acceleration: .33 ft/s<sup>2</sup>

The Energy Chain® ensures power is supplied for tipping the bucket.



# More examples of heavy du



Vertical boom for semi-submersible platform



A challenging zig-zag application for the decommissioning of a nuclear power plant



Coal bulk handling with a covered Energy Chain System®



Power supply for transport of coal to a dump



Steel construction for a spreader in a lime plant



Ventilation system in underground storage at a power plant

# ty and extreme applications



Three Energy Chains® in operation 24 hours a day for more than 4 years in a brick plant



Energy Chains® in an aluminium plant – operating for 9 years trouble-free, with a travel length of 203 ft, and speed of .98 ft/s



High dirt accumulation during oxide removal of rails to be milled



An Energy Chain®, in operation since 1998 at a fertilizer plant



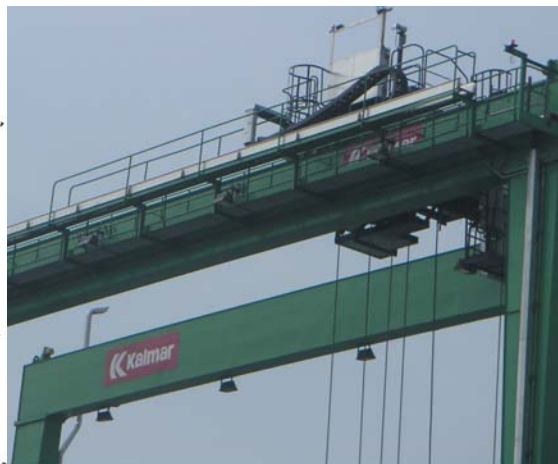
High temperature, heavy load, lots of dust and high speed



Ventilation machine in a lime plant



# More examples of heavy du



A 72 ft travel



A large crane with up to 2,625 ft of travel



Heating plant



Energy Chain® with Chainflex® in a truck washing facility with fine road-dust and gravel/mud debris



Plaster dust



High temperature, high speed, lots of dust

# ty and extreme applications



Power plant supply for dredger excavator in a coal dump



Shipyard refueling point for cargo ships



Compost mud



Crane builder with a travel of 63.9 ft and speed of 196 ft/min



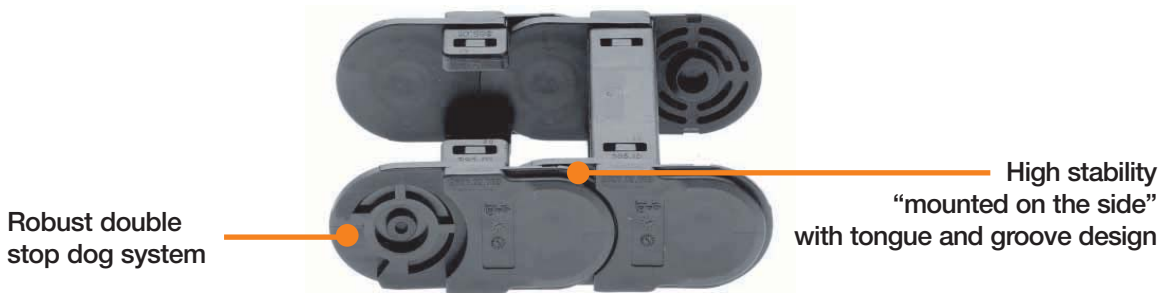
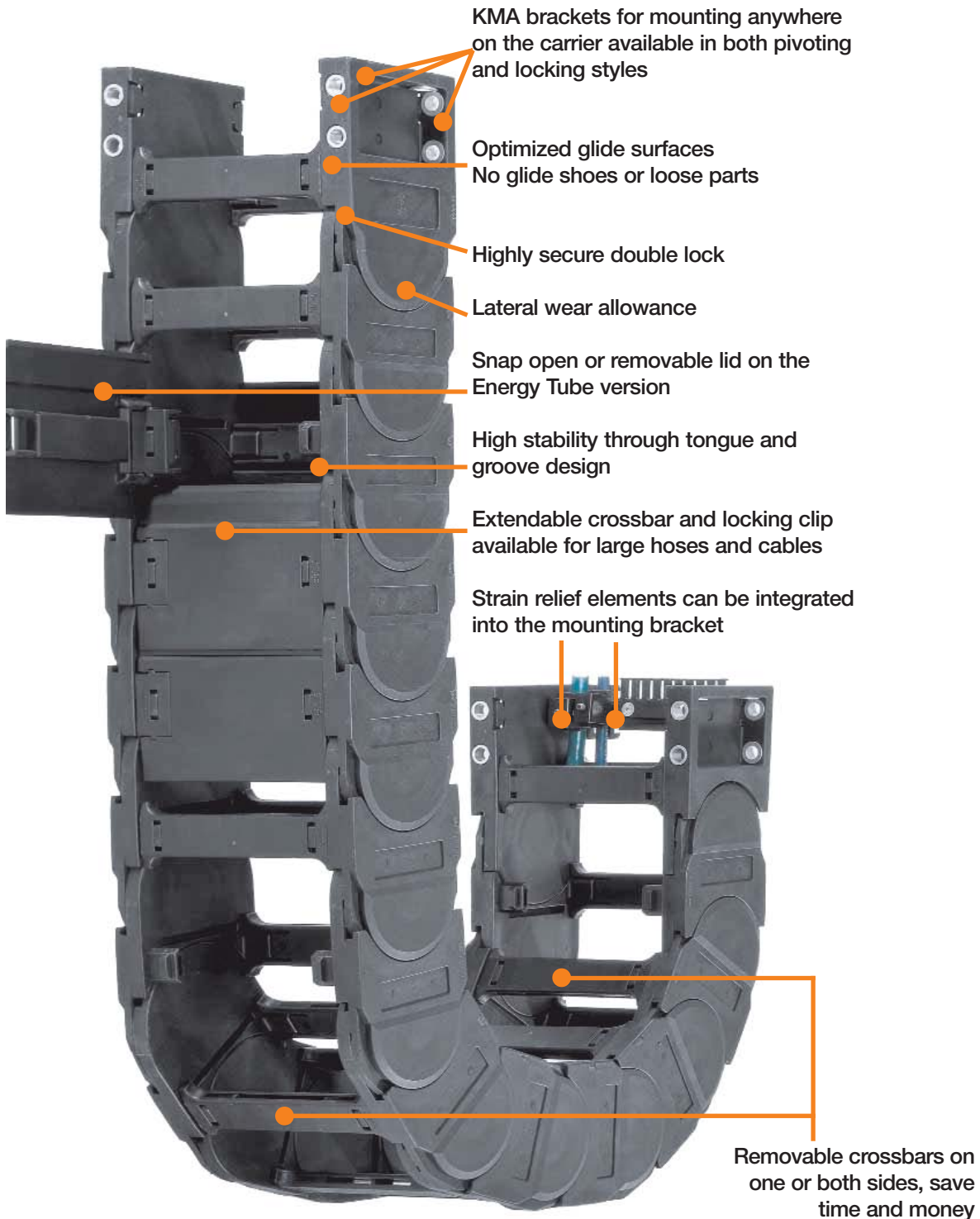
Steel and iron plant, lots of dust, high speed



Long travel application in a bulk material stocker



# High strength



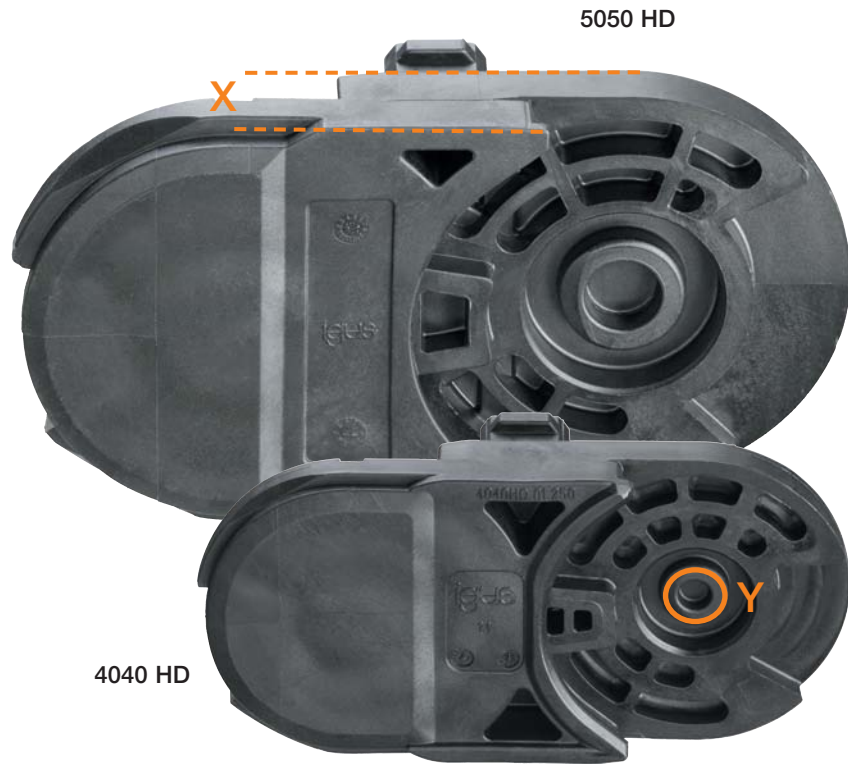


# Strengthened versions

The tested and proven series 4040 and 5050 now also in Heavy Duty options: 4040HD und 5050HD.

Designed for extremely heavy fill weights at high speeds. Reinforced version of pin as well as side wall\*.

- Bearing surfaces enlarged four-fold in the range of stops
- Side-wall thickness and bearing surface of the pin reinforced up to 140%
- Available with or without rollers  
\* Compared to Series 4040 and 5050



- 5050 HD to classic 5050:  
Y: +120%, X: +7.5 mm
- 4040 HD to classic 4040:  
Y: +140%, X: +9 mm

**Rol-E-Chain:** Reduce the drive power needed to move the Energy Chain® by 25%. Travel up to 2,625 ft. possible.



Rollers extend 0.3 mm over the side link

# Polymer accessories



KMA versatile mounting options, including pivoting or locking brackets



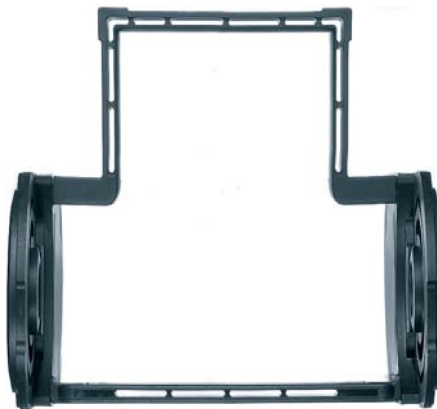
Multiple interior separation options



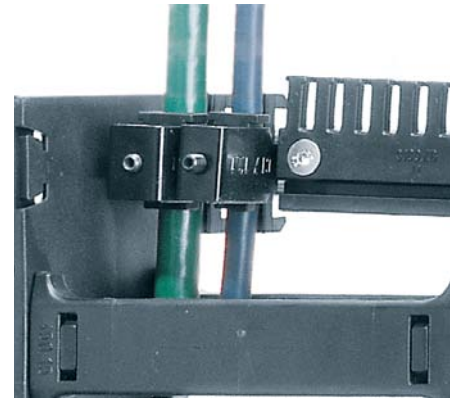
Extender links for limitless expansion



Spacer for side-mounted chains



Extender crossbar for oversized hoses



Strain relief elements can be integrated into the mounting brackets



Pivoting mounting bracket



Available in an enclosed tube version with snap open lids

# Metal accessories



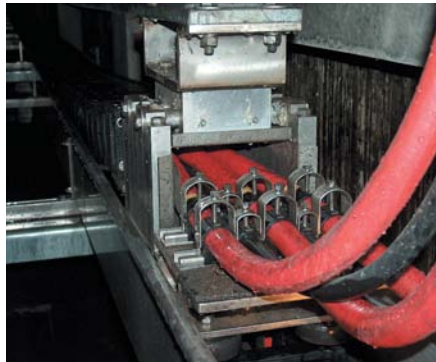
Floating towing arm, counteracts misalignment



Heavy-duty assembly kit suitable for igus® guide trough systems



Extension link support with several extension links



Clamps for safe strain relief of cables



Long travels with aluminum and steel guide troughs



PPDS, can be accessed via e-mail or SMS for monitoring system health.



# Chainflex® cables



**Bus cables:** Chainflex® bus cables are available for all types of bus systems. Also available in large cross sections, for example 3 x 2 x 2.5 mm<sup>2</sup> or with power supply cores in the same a cable.



**Fibre optic and coaxial cables:** Available in plastic (980/1000) or fiberglass (62.5/125 or 50/125), 1, 2, 6 or 12 fibers – all fiberoptic cables are tested for more than several million cycles.



**Control cables:** PVC, PUR, TPE – A wide selection of materials is available for all applications – also available are shielded and unshielded cables and a large number of cross sections and number of



**Motor and servo cables:** Shielded servo cables available for inverter operation up to 600/1000 V, with one or two shielded signal pairs. Shielded and unshielded motor cables of 1.5 to 95 mm<sup>2</sup> are also offered.



**Single core CF Crane:** igus® offers a shielded, highly flexible single-core for up to 6/10kV. It is a medium voltage cable for the most demanding requirements in crane building, heavy machinery, etc. with cross sections: 1 x 25/16 to 1 x 95/16.

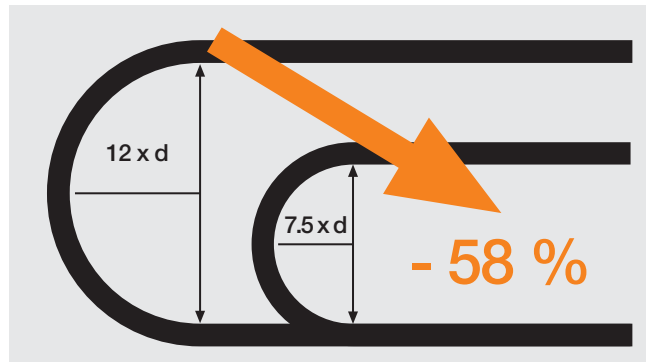


**Single core motor cables:** These are shielded and unshielded single core motor cables for the most demanding requirements with cross sections: of 4 to 185 mm<sup>2</sup> and voltage classes of 600/1000 V.

# Facts and figures

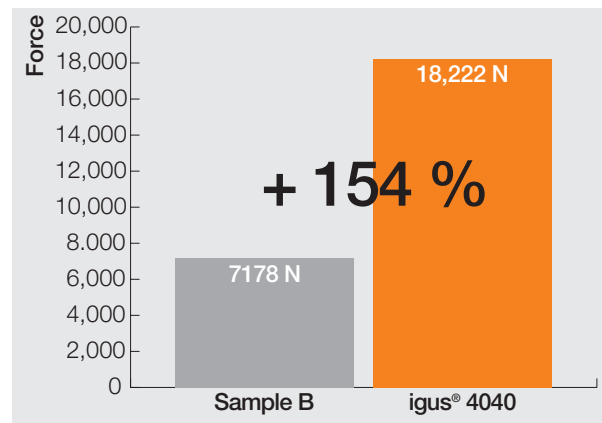
## Save space with CF310 single conductors

- High bending fatigue tolerance at small bending radii
- Optimum height/width ratio, due to small bending radii
- Tight bending radii, even in long travel applications



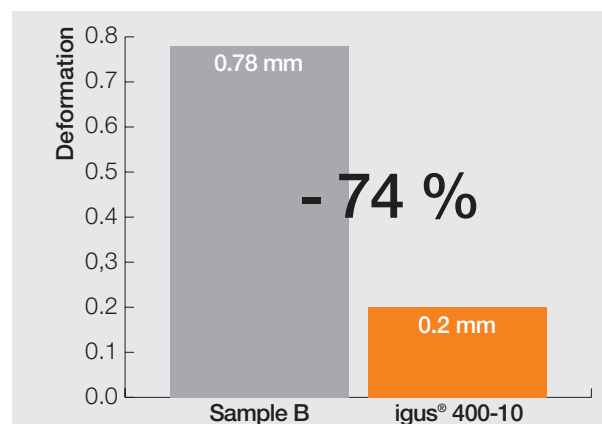
## E4/4: high pull-force resistance

- Long travel distances up to 800 m with high load carrying capacity
- High additional loads on long travels
- High speeds and accelerations



## Low wear for long-travel applications

- Low abrasion for gliding applications
- Consistently low wear after short break-in time
- Further minimization by the application of roller chains

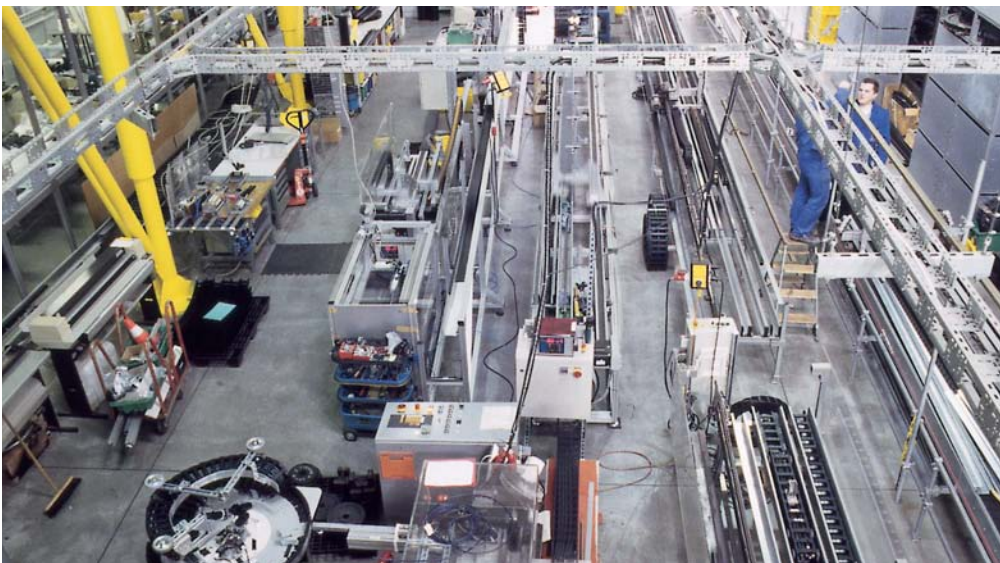


# Complete systems!



Complete, ready-to-install Energy Chain System® delivered on a drum

# Passing the test!

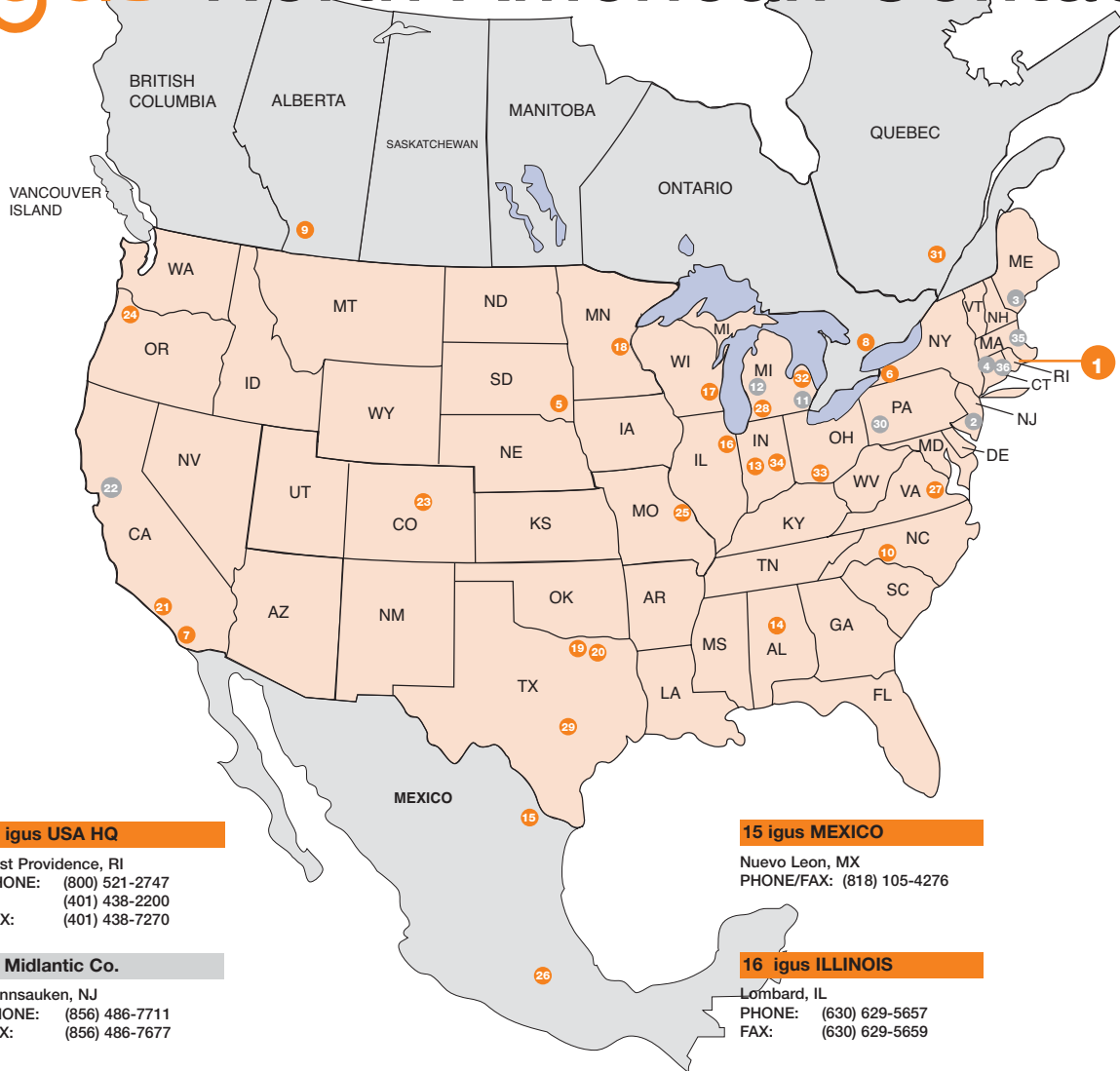


More than 80 tests on Energy Chains® and Chainflex® cables are always running at the igus® test lab.

Many igus® Energy Chain Systems® are certified, tested and recognized. Ask us!



# igus<sup>®</sup> North American Contacts



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 FAX: (856) 486-7677

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 FAX: (207) 967-2992

## 4 tsi Motion Eng. Systems

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 FAX: (905) 760-8688

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 FAX: (704) 522-6215

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Middletown, CT  
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 FAX: (860) 685-0359

# Also from igus®



The iglide® catalog showcases more than 12 standard polymer material blends (additional blends available for custom orders). These engineered plastics are used throughout the plain, spherical and linear bearing product lines, as well as in the gliding elements of all DryLin® linear guide systems. All iglide® bearings and materials are self-lubricating and maintenance-free. More than 8,000 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 for ease of use and simplicity to quickly locate what you need. All products are backed by a complete system warranty. Various on-site services and harnessing solutions are available.



The Chainflex® catalog contains more than 700 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® and all types of cables, including control, signal, bus, power, fiber optic, servo, and Ethernet are available.



The Y.E.S. (Young Engineers Support) Program offers free product donations to students and educators for use in design competitions, school projects and engineering curriculums. Through Y.E.S., igus fosters the mechanical design aspirations of young engineers and educates them about the merits and benefits of plastic components. To learn more or to become a member of the Y.E.S. Program, visit [www.igus.com/yesprogram](http://www.igus.com/yesprogram).

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e-mail: [sales@igus.com](mailto:sales@igus.com)