

offshore plastic

E-Chains[®], Chainflex[®] Cables, Polymer Bearings



Mud resistant

acc. NEK 606

Ex II 2 GD

igus[®].de
plastics for longer life[®]



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

igus® is a specialist in the area of polymer research, with more than 40 years of experience. Special high performance polymers allow the use of igus® E-Chains® and bearings in almost all environments. Heat, cold, corrosion, humidity, dirt – we have a solution. In more and more heavy duty applications, steel systems are successfully replaced with igus® plastic E-Chains®, because of their extraordinary capabilities:

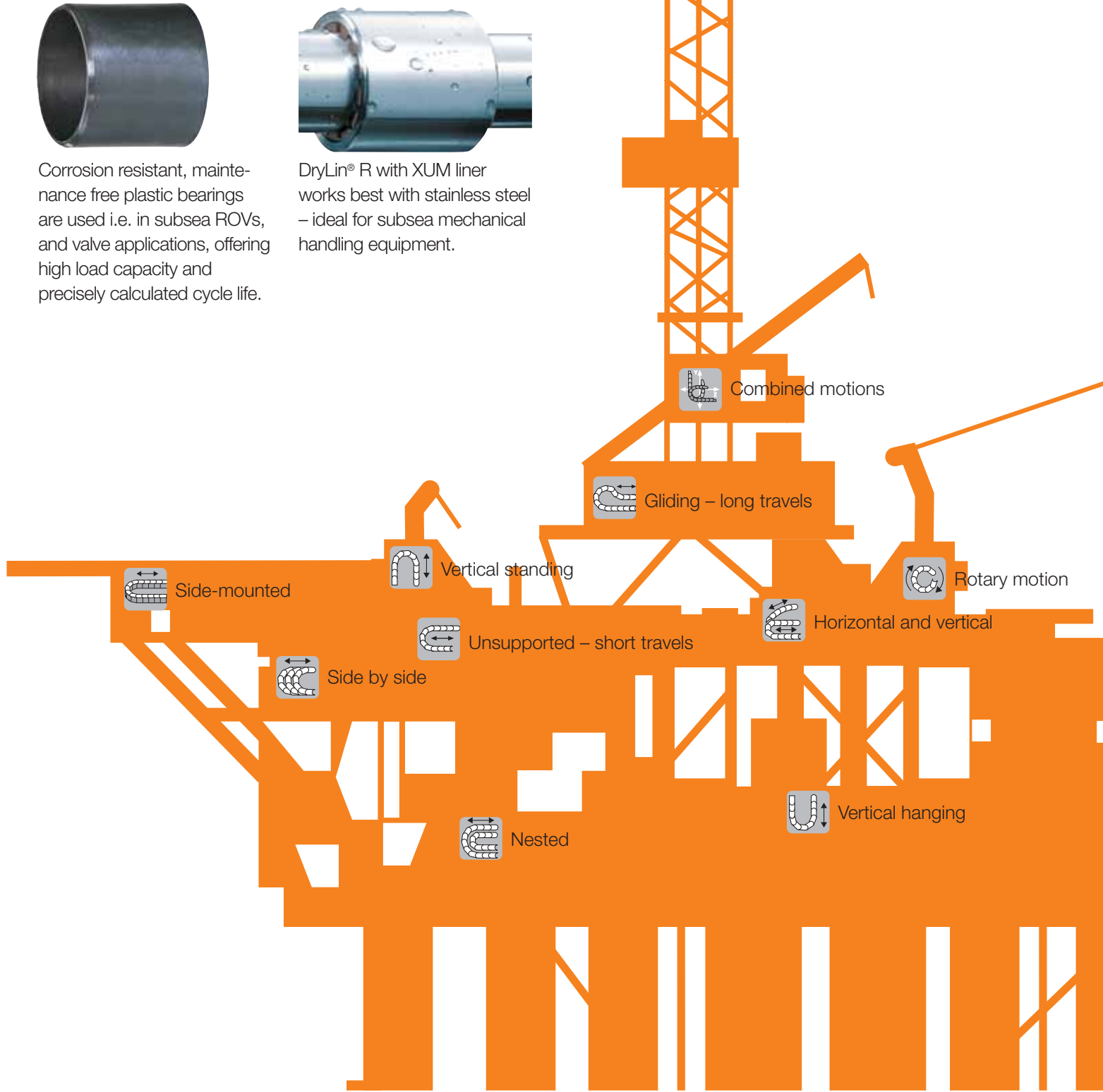
- Corrosion free, UV- and sea water resistant
- Light weight AND high stability
- Low maintenance and long service life
- Resistant to dirt, sea water, chemicals, extreme temperature
- Easy to install
- Flexible modular design
- ATEX solutions available
- igus® E-ChainSystems® in combination with igus® Chainflex® cables

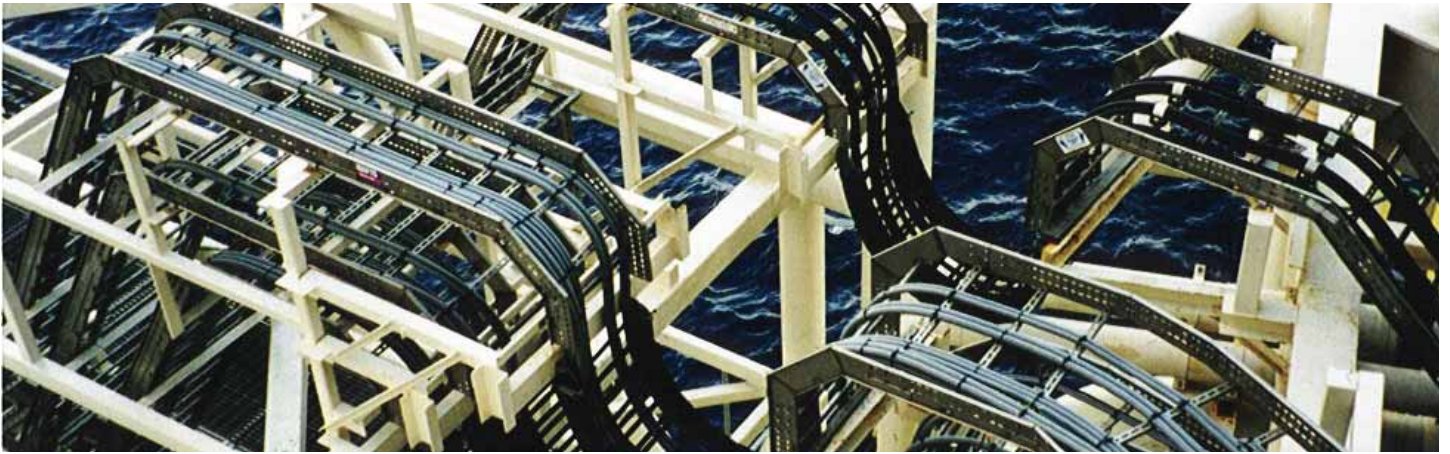


Corrosion resistant, maintenance free plastic bearings are used i.e. in subsea ROVs, and valve applications, offering high load capacity and precisely calculated cycle life.



DryLin® R with XUM liner works best with stainless steel – ideal for subsea mechanical handling equipment.





Corrosion free, UV- and sea water resistant: Fully harnessed E-Chain® series 600 in a hanging application with high fill weights and sea water resistant. (North Sea)



E-Chain® with reverse bend radius guides cable and hose package on A-frame onboard anchor handler



Horizontal Trolley, National Oilwell Varco AS, Norway



Light weight AND high stability: Polymer E-Chain® tames stiff hydraulic hoses.



E4 Series 600 extension link – long travel application onboard West Navigator (Norway)



Light weight AND high stability: Short/cross travel application. Series E4/4 guided in a stainless steel guide trough.



Rig skidding application on the Claymore, North Sea



igus® E-Chain® series 600 and igus® DryLin® linear slides on a roughneck "V-Tech UniRough"



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



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



Series 600 with extension link in an igus® designed special guiding channel. (Caspian Sea)



Pipehandling application supplied by igus® E-Chain®



Horizontal Trolley for National Oilwell Varco AS, Norway



ATEX tested conductive igus® material prevents electrostatic buildup. Delivered as fully harnessed ReadyChain®



ATEX version igus® E-Chain® System, series E4, harnessed with hydraulic hoses and igus® Chainflex® cables. Here shown on a test stand, now in operation on Dalia FPSO (linear motion of mooring)


ATEX-Material


The conductive material igumid ESD has offered explosion protection and protection against electrostatic buildup since 2002. This material is based on a material which was developed as early as 1992, modified in 2002 and certified by the PTB as early as eleven years ago.

- igumid ESD with PTB certificate
- All standard E-Chains® available in igumid ESD
- Tested and successfully proven in explosion-protection areas for many years
- Color: Slate gray (similar to RAL 7015) for easy differentiation

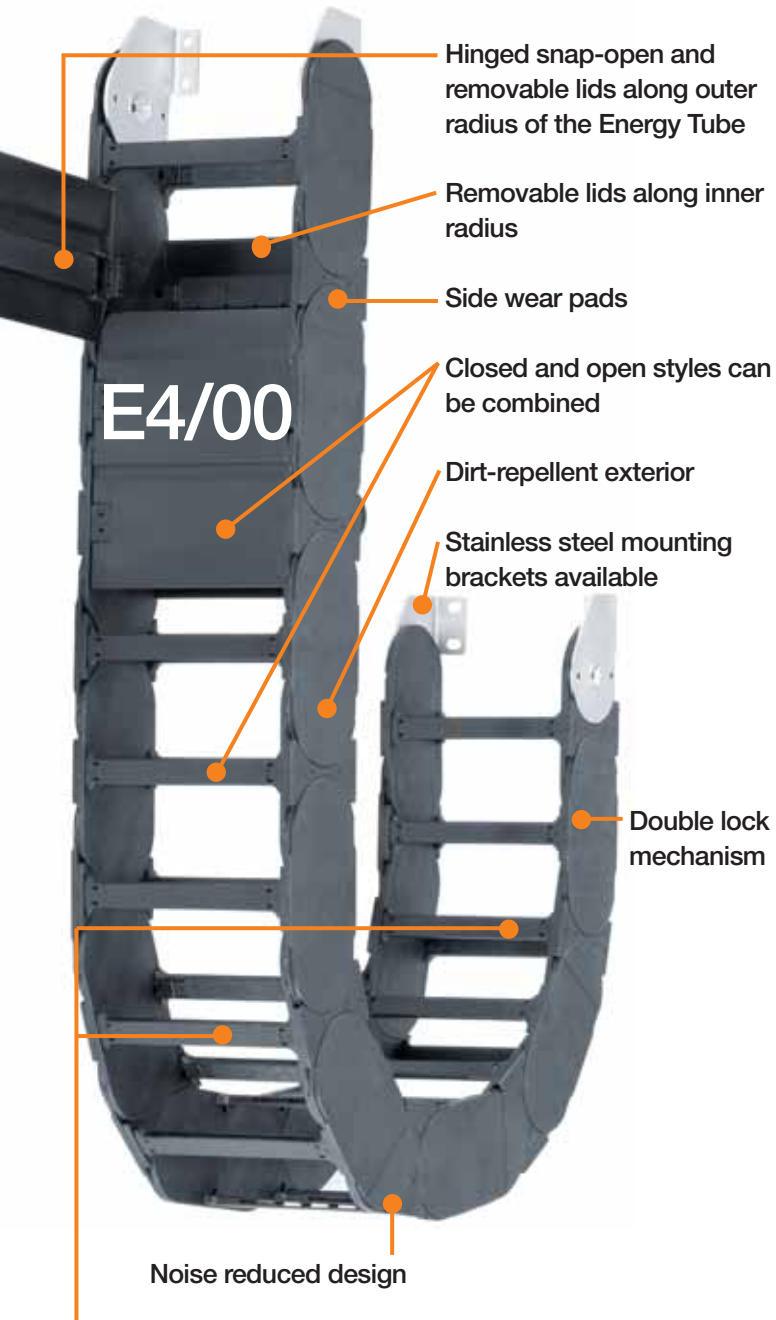
ATEX Products – your benefits:

- Tested with over 100 million cycles for most demanding requirements, also for long travels
- Snap-open chains, snap-open tubes, three-dimensional chains with mounting brackets and interior separation available in ESD/Atex version
- Short lead times
- Ordering and shipping from 8 am to 8 pm plus Saturdays from 8 am to 12 pm (in Germany)

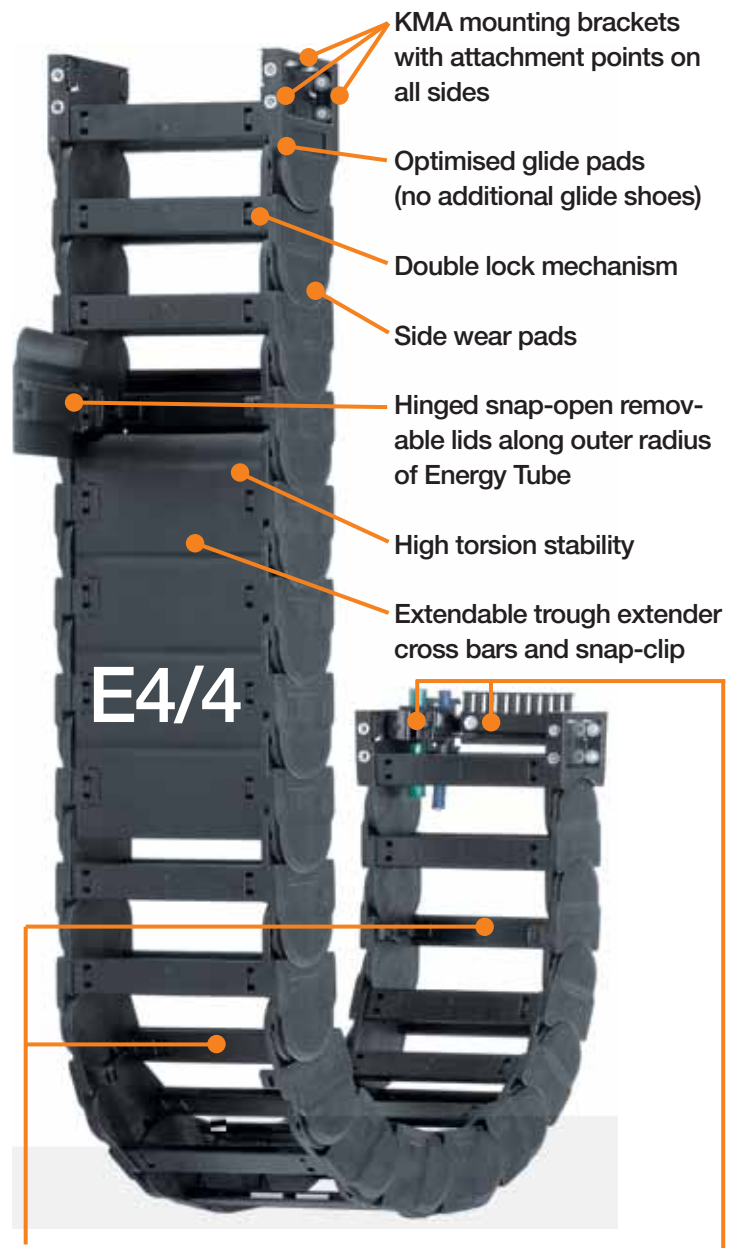
Marking:  II 2 GD – Special color of the ESD E-Chain® color: gray (similar to RAL 7015)

Investigations required after classification  II 2 GD in accordance with the standards and regulations listed below were conducted and verified by the PTB: Cenelec TR 50404:2003 previously: DIN 53482/VDE0303/Part 3, verified by the PTB), BGR 132:2003 and ZH1/200

Polymer E-ChainSystems®



Crossbars on Energy Chains® are removable along both radii

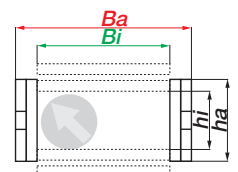
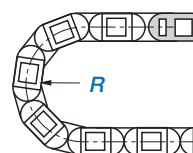


Crossbars on E-Chains® are removable along both radii

Strain relief elements can be integrated with the mounting bracket

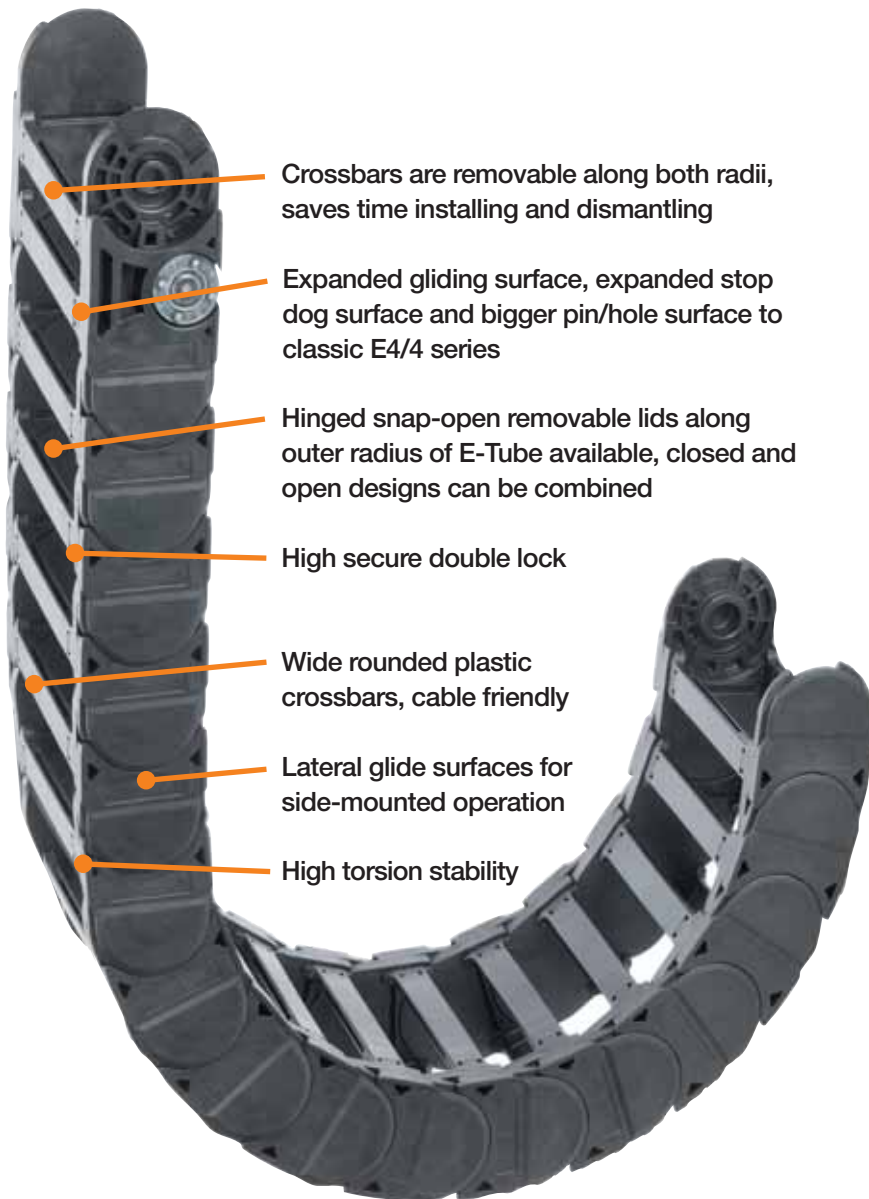
Series	Inner height <i>hi</i> [mm]	Inner width <i>Bi</i> [mm]	Outer width <i>Ba</i> [mm]	Outer height <i>ha</i> [mm]	Bending radius <i>R</i> [mm]
210	21	30 - 120	44 - 134	28	38 - 200
220	28	40 - 300	60 - 320	42	55 - 250
280	32	50 - 400	73 - 423	54	63 - 300
380	42	50 - 400	76 - 426	64	75 - 350
400	56	50 - 600	84 - 634	84	135 - 500
600	108	200 - 600	252 - 652	140	200 - 1000
640	112	87 - 562	139 - 614	140	200 - 1000
800	200	200 - 600	260 - 660	236	325 - 1000
840	204	100 - 563	160 - 623	236	325 - 1000

Series	Inner height <i>hi</i> [mm]	Inner width <i>Bi</i> [mm]	Outer width <i>Ba</i> [mm]	Outer height <i>ha</i> [mm]	Bending radius <i>R</i> [mm]
2828	32	50 - 400	73 - 423	54	63 - 300
3838	42	50 - 400	77 - 427	64	75 - 350
4040	56	50 - 600	86 - 636	84	135 - 500
5050	80	50 - 600	100 - 650	108	150 - 1000



E-Chains® Heavy Duty series

E-Chain® family for the hardest demands



Crossbars are removable along both radii, saves time installing and dismantling

Expanded gliding surface, expanded stop dog surface and bigger pin/hole surface to classic E4/4 series

Hinged snap-open removable lids along outer radius of E-Tube available, closed and open designs can be combined

High secure double lock

Wide rounded plastic crossbars, cable friendly

Lateral glide surfaces for side-mounted operation

High torsion stability

The Heavy Duty Chain family was developed in view of the following applications:

- High cable loads
- High speeds
- Long travel lengths
- Strong dirt loads

The improved E4/4 Heavy Duty takes cable carrier stability to new levels. Strength and cycle life are improved by significantly increased gliding and load bearing surfaces.

E4/4 Heavy Duty takes higher push/pull forces, at the same inner dimensions as regular E4/4 series.

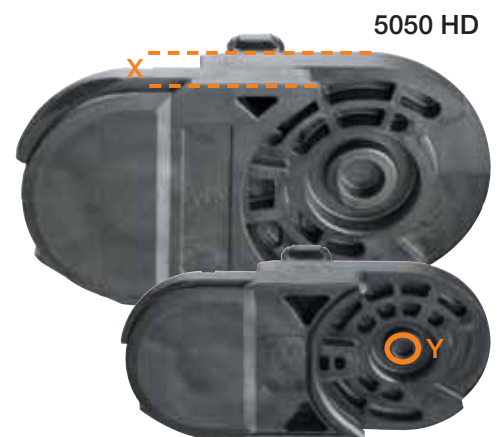
Supplied from stock for the HD series:

- Roller glide for the reduction of the tensile/shear forces
- Extension link for large widths and for raising the load capacity
- Separators for the adaptation of the interior separation in the cable layout
- Mounting brackets for the fastening of the chain at fixed and moving ends



0,3 mm

Rollers extend 0.3 mm over the side link **Rol E-Chain®**: Reduction of drive power required to below 25 % for moving the E-Chain®, Travel up to 800 m possible



5050 HD

4040 HD

Series	Inner height <i>hi</i> [mm]	Inner width <i>Bi</i> [mm]	Outer width <i>Ba</i> [mm]	Outer height <i>ha</i> [mm]	Bending radius <i>R</i> [mm]	With roles
4040HD	56	50 - 600	104 - 664	84	135 - 500	4040RHD
5050HD	80	50 - 600	110 - 660	108	150 - 1000	5050RHD

5050 HD to classic 5050:

Y: +120%, X: +7,5 mm

4040 HD to classic 4040:

Y: +140%, X: +9 mm

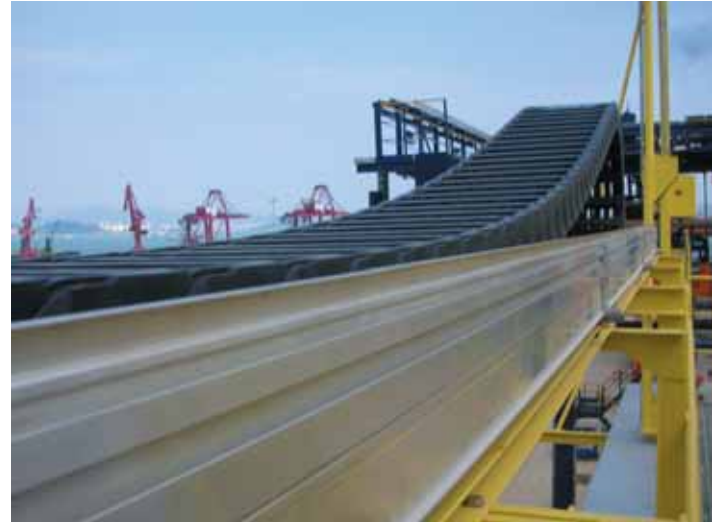
Accessories

Super Alu Guide Trough – Crane version

It is possible to extend the Super Alu Guide Trough for the demanding plant sector to a heavy duty version. This trough has got stronger installation brackets and also additional parts like glide pads for protection of wear and friction and silencer profiles to reduce the noise level of the roll of the E-Chain®.

Modular Trough System

- Very quick and easy, universal and flexible assembly – connects with underground, independent from profile length and location of trough section interfaces
 - Various fixation methods with installation brackets, slide-on fasteners and interface connectors
 - Wear protective, side-mount glide bars for high speed applications
 - Corrosion proof through seawater resistance
 - Available for most igus® E-Chain® series
- Tool box with basic version and add-on items for upgrading to heavy duty industrial applications



Installed Super Alu Guide Trough



KMA with attachment points on all sides



Diverse interior separation options



Extension link available for endless widening



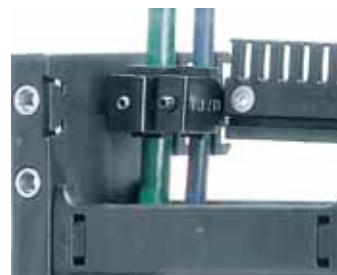
Pivoting mounting brackets



Separators for side-mounted chain



Extender crossbar available for very large hoses and conduits



Strain relief elements can be integrated with the mounting bracket



Asymmetrical vertical separator for combination with spacers

Chainflex® Cables

igus® Chainflex® cables – proven in challenging applications

Our customers demand that their machines and equipment must run. Non-stop. Worldwide.

Malfunctions such as cable failure in moving applications must not occur and cause expensive downtime, even and especially when installed under the most adverse environmental conditions.

● Chainflex® cables are developed and optimized solely for the special requirements of continuously flexing applications.

- Diligent testing in the igus® test laboratories (on more than continuous moving 40 different test rigs)
- More than 750 different sizes of igus Chainflex® cables are available from stock: Motor / Servo, Data, Bus, Control, Fiber optic
- CE

A lot of Chainflex® types with

- UL/CSA certifications
- MUD resistant acc. to NEC606

igus® Chainflex® – tested, tested, tested

As a manufacturer of E-Chains® and special cables for E-Chains®, igus® tests countless combinations. At the igus® research laboratory in Cologne, continuous testing is performed on more than 35 test rig installations under the most challenging conditions. All test results are evaluated and utilized in databases.

An extensive data pool provides precise, reliable information on service life and serves as the basis of new product developments.

Test data for E-Chains® and Chainflex® cables enable igus® to provide a meaningful systems warranty for fully harnessed ReadyChain® subassemblies.



Continuous-flex inside an E-Chain®: igus® Chainflex® tested at -40°C



Chainflex® Cables...

Chainflex® Cable	Jacket	MUD resistant acc to NEK 606	Shield	Bending radius, moved [factor x d]	Temperature, moved from/to [°C]	Flame-retardant	Oil-resistant	Halogen-free	UV-resistant	Torsion resistant
Control cables										
 CF5	PVC			6,8-7,5	-5/ +70	✓	✓	✓	✓	✓
 CF6	PVC		✓	6,8-7,5	-5/ +70	✓	✓	✓		
 CF170.D	PUR	✓		7,5-10	-35/ +80		✓	✓	✓	✓
 CF180	PUR	✓	✓	7,5-15	-35/ +80		✓	✓	✓	
 CF7	PUR	✓		6,8-7,5	-20/ +80	✓	✓	✓	✓	✓
 CF7.D	PUR	✓		6,8-7,5	-20/ +80	✓	✓	✓	✓	✓
 CF8	PUR	✓	✓	6,8-7,5	-20/ +80	✓	✓	✓		
 CF2	PUR	✓	✓	5	-20/ +80	✓	✓	✓		
 CF9	TPE			5	-35/ +100		✓	✓	✓	✓
 CF10	TPE		✓	5	-35/ +100		✓	✓	✓	
 CF9.UL	TPE			5	-35/ +100	✓	✓	✓	✓	✓
 CF10.UL	TPE		✓	5	-35/ +100	✓	✓	✓		
Data cables										
 CF111	TPE		✓	10	-35/ +100	✓	✓	✓		
 CF11	TPE		✓	10	-35/ +100		✓	✓	✓	
 CF12	TPE		✓	10	-35/ +100		✓	✓	✓	
Bus cables										
 CF BUS	TPE		✓	10-12,5	-35/ +70	✓	✓	✓		
 CF11.LC	TPE		✓	10	-35/ +70		✓	✓	✓	
 CF11.LC.D	TPE		✓	10	-35/ +70		✓	✓	✓	
 CF14 CAT5	TPE		✓	12,5	-35/ +70		✓	✓	✓	
Koax cables										
 CF Koax 1	TPE			10	-35/ +100		✓	✓	✓	

These values are based on concrete applications or tests. These values do not represent the limit of what is technically feasible.

Chainflex® types mentioned in the catalogue as "resistant to bio oil" have been tested by DEA according to VDMA 24568 with Plantocut 8 S-MB.

...for Offshore applications

Chainflex® Cable	Jacket	MUD resistant acc to NEK 606	Shield	Bending radius, moved [factor x d]	Temperature, moved from/to [°C]	Flame-retardant	Oil-resistant	Halogen-free	UV-resistant	Torsion resistant
Measuring system cables										
	CF211	PVC	✓	10	-5/ +70	✓	✓			
	CF113.D	PUR	✓	✓	10	-20/ +80	✓		✓	✓
	CF111.D	TPE		✓	12	-35/ +100	✓	✓		✓
	CF11.D	TPE		✓	10	-35/ +100		✓	✓	✓
Fibre optic cables (FOC)										
	CFLG.2H	PUR	✓		12,5	-20/ +60		✓	✓	✓
	CFLK	PUR	✓		12,5	-20/ +70		✓		✓
	CFLG.G	TPE			15	-20/ +60		✓	✓	✓
Servo cables										
	CF21.UL	PVC		✓	7,5	-5/ +70	✓	✓		✓
	CF260	PUR	✓	✓	10	-20/ +80		✓	✓	✓
	CF27.D	PUR	✓	✓	7,5	-20/ +80	✓	✓	✓	✓
Power cables										
	CF30	PVC			7,5	-5/ +70	✓	✓		✓
	CF31	PVC		✓	7,5	-5/ +70	✓	✓		✓
	CF34	TPE			7,5	-35/ +90	✓	✓		✓
	CF35	TPE		✓	7,5	-35/ +90	✓	✓		✓
	CF300.UL	TPE			7,5	-35/ +90	✓	✓		✓
	CFPE	TPE			7,5	-35/ +90	✓	✓		✓
	CF310.UL	TPE		✓	7,5	-35/ +90	✓	✓		✓
	CF BRAID	TPE			7,5	-35/ +70	✓	✓		✓
	CF BRAID.C	TPE		✓	7,5	-35/ +70	✓	✓		✓
	CF CRANE igupren	igupren		✓	10	-20/ +80	✓	✓		✓

Polymer Bearings

DryLin® T – Heavy Duty

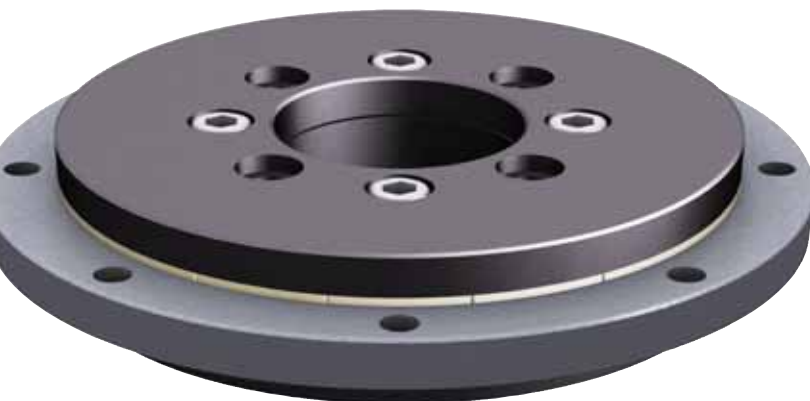
For the most extreme environmental conditions



- Linear guide carriage for extreme conditions (dirt, glue resins, chips, mud, etc.)
- Polymer sliding elements of iglidur® J are fixed by the metal end caps and cannot be lost
- Dimensions equivalent to standard recirculating ball bearings

igidur® PRT

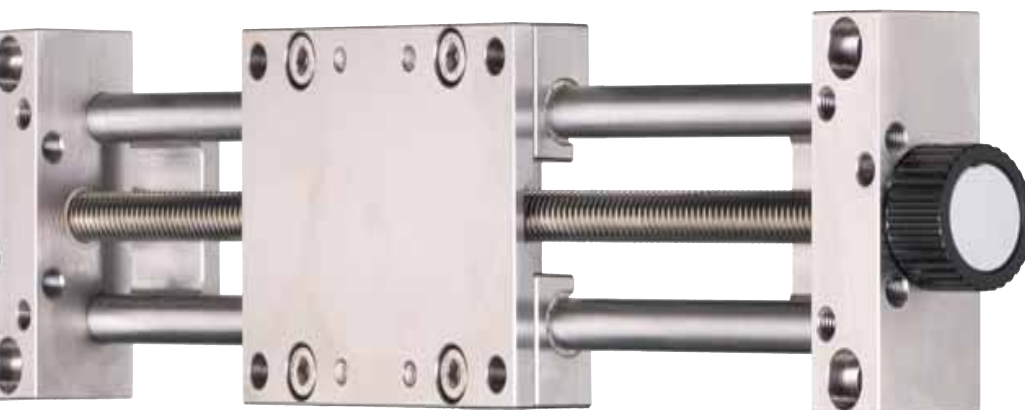
Many sizes of the maintenance-free slewing-ring bearing



The slewing ring bearing system PRT has quickly proven itself in a variety of applications. Customer demand prompted igus® to add more sizes:

- Compact: inner diameter 30 mm up to 200 mm
- Maintenance-free
- High wear resistance
- High stiffness and handles high moment loads
- Axial loads up to 100.000 N (static)
- Ease of assembly

Stainless steel linear slide table: SLW-ES



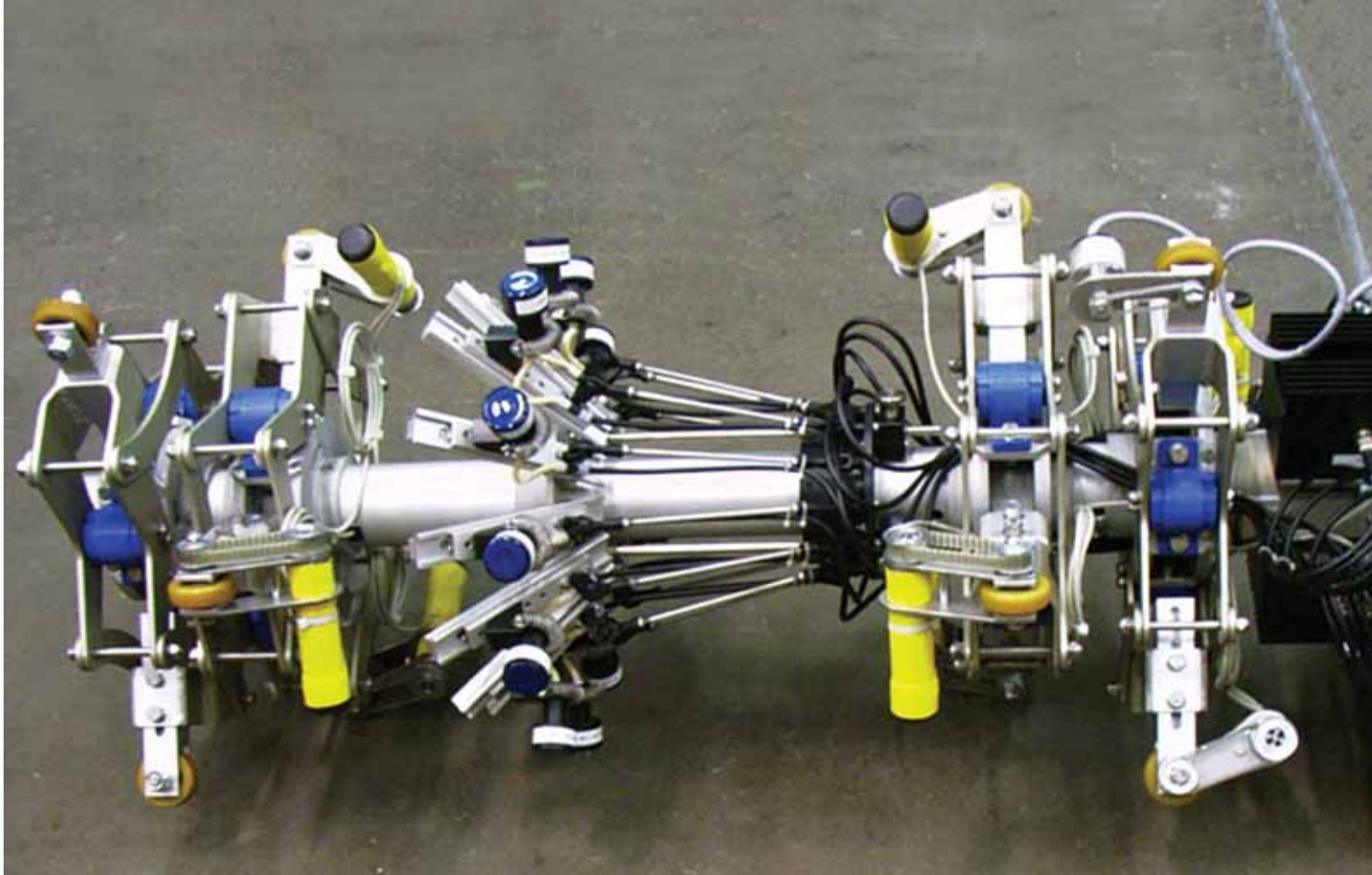
The stainless steel leadscrew linear modules are designed for use in aggressive environments.

- All metallic components are corrosion resistant stainless steel (1.4305 or 1.4571)

Bearing material

- iglidur® X – highest resistance against water, chemicals, shocks

Also available as simple linear guide system without spindle drive.



Inspection equipment for offshore drilling riserplant

Application with igus® Polymer Bearings

„On the drilling platforms in search of new oil and gas wells in the offshore industry, so-called „drilling risers“ are used as connecting elements between drill platform and the ground of the sea. The use of these risers in aggressive media and under extreme mechanical stress (corrosion, abrasion, erosion, deformations) requires a regular inspection of the riser for safety and environmental reasons.

The presented inspection appliance scans the complete inner surface of the extremely stressed main tube of the riser in a single working cycle.

The bolts of the articulations are equipped with polymer bearings GFM-0810-05. The bearings support the transmission the enormous forces with low friction free of stick-slip.

The heart of the sensor adjustment are linear guides and tie bars. Every single

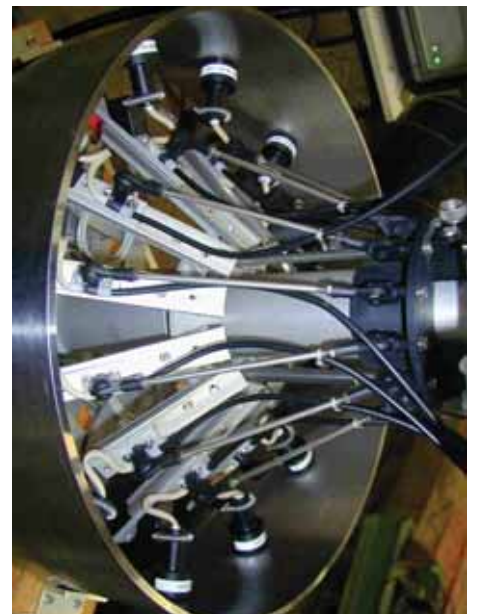
sensor is mounted onto a miniature-guide DryLin® NK-02-17.

The sliding carriage is connected to the central adjustment via a variable cross bar. These cross bars consist of rod ends with right and left hand thread EBRM-05 and EBLM-05 respectively. The counterparts of these are clevis joints KERMK-05.

Compared to conventional method, the described inspection apparatus lowers the effort and time needed for the inspection considerably. At the same time, the quality and trustworthiness of the Inspection is much higher.

All in all, a high efficiency and economy are achieved.”

**Reinhold Kammann / Manfred Worms,
Tuboscope Vetco (Germany) GmbH,
Celle**



Linear guides and tie bars

Fully harnessed and ready to connect: igus® ReadyChains®

Reduce storage costs for cables, E-Chains® and plugs to zero

You can do without storage of high flexible cables, plugs and any other add-on pieces due to our rapid and guaranteed delivery times.

Cut throughput time in half

Because of a polished logistic igus® delivers readymade systems almost worldwide within 2-8 days on the guaranteed date.

React flexibly to order income fluctuations

With ReadyChains® you are always prepared for cyclical ups and downs. In this field you can pass the buck of capacity fluctuations to us.

Minimize machine downtime

Play it safe, it's the little things that always cause problems. Buying numerous single parts not only increases the risk of failure of your plants, it also complicates troubleshooting. You will get a system solution with ReadyChains®. Any system is checked in our test centre. igus® is standardized according to ISO 9001:2000.

Reduce the number of suppliers and orders by 75%

One order, one invoice, one delivery, one partner. Don't care about looking for numerous parts from numerous suppliers. We have the knowledge to provide you quickly with the optimal parts.

ReadyChain® installation on a bulkhandling Crane, supervised by igus®. Weight of the E-Chain® incl. Chainflex® is more than 2 tons.





...more than 850 Chainflex® special cables: www.chainflex.de



System harnessing by specialists according drawing

You determine the degree of harnessing

We harness from simple E-ChainSystems® with inserted Chainflex® cables to complex systems. These systems may include all cables and hoses (pneumatic, hydraulic), patch plugs, inner partitions, connecting elements and connecting parts as requested.

You determine the size

Any size is possible. Because of our upto-date production processes we can deliver fast and cost effective custombuilt or serial production products.

You determine the travel length

ReadyChains® offers the whole spectrum of possible travels of the igus® E-Chains®. We harness anything from extremely short to long travels. Safe transportation guarantees that your ReadyChain® arrives undamaged.



Special igus® drum spooling machine for all heavy ReadyChain® systems

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igus® E-ChainSystems® Catalogue
70,000 products
Available in many languages,
for example German, English,
French and Dutch



igus® Chainflex® Catalogue
850 cable products
Available in many languages,
for example German, English,
French and Dutch



CD ROM xigus
Electronic catalogue
with expert system



CD ROM
Crane presentation



CD ROM xiglidur
Electronic catalogue
with expert system



Application
catalogue

Worldwide service

igus® employs over 1,500 people in Germany and 26 international subsidiaries and works with representative partners in more than 30 other countries. **Your benefits:** we are right where your customers are. Offshore specialists are readily available to serve you. Fast delivery is guaranteed, worldwide. All standard catalogue items are available from stock.