

KABELSCHLEPP



CABLE & HOSE CARRIER SYSTEMS FOR CRANES

Content:

- 1. Introduction to KABELSCHLEPP and
TSUBAKI**
- 2. Products**
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- 4. New development: RSC-System**

Tsubaki KABELSCHLEPP

60 years since the initial **idea** became a **patented solution**



1953

Invention of the **cable carrier**

Dr.-Ing. Gilbert Waninger
an employee of von
H.A. Waldrich in Siegen



1954

Foundation of
KABELSCHLEPP GmbH

Dr.-Ing. E.h. Oskar Waldrich



Wenden-Gerlingen Headquarters

Everything under one roof.



- Production of all cable carrier systems made of steel and plastic
- Assembly plant
- Project division
- Design and engineering of all products
- Laboratory
- Worldwide distribution center
- Quality management

2010: Integration into the TSUBAKI Group

- For **more than 40 years**, both companies have been closely cooperating partners.
- With this integration, we will leverage our successful business relationship in **one strategic enterprise**.



TSUBAKI KABELSCHLEPP Headquarters
Wenden, Germany



TSUBAKIMOTO CHAIN Kyotanabe Plant
Kyoto, Japan

Cable Carriers for crane applications

**Automated Stacking
Cranes (ASC)**



**Ship To Shore
Container Cranes (STS)**



**Rubber Tyre Gantry
(RTG)**



Reach Stacker



**Rail Mounted Gantry
(RMG)**



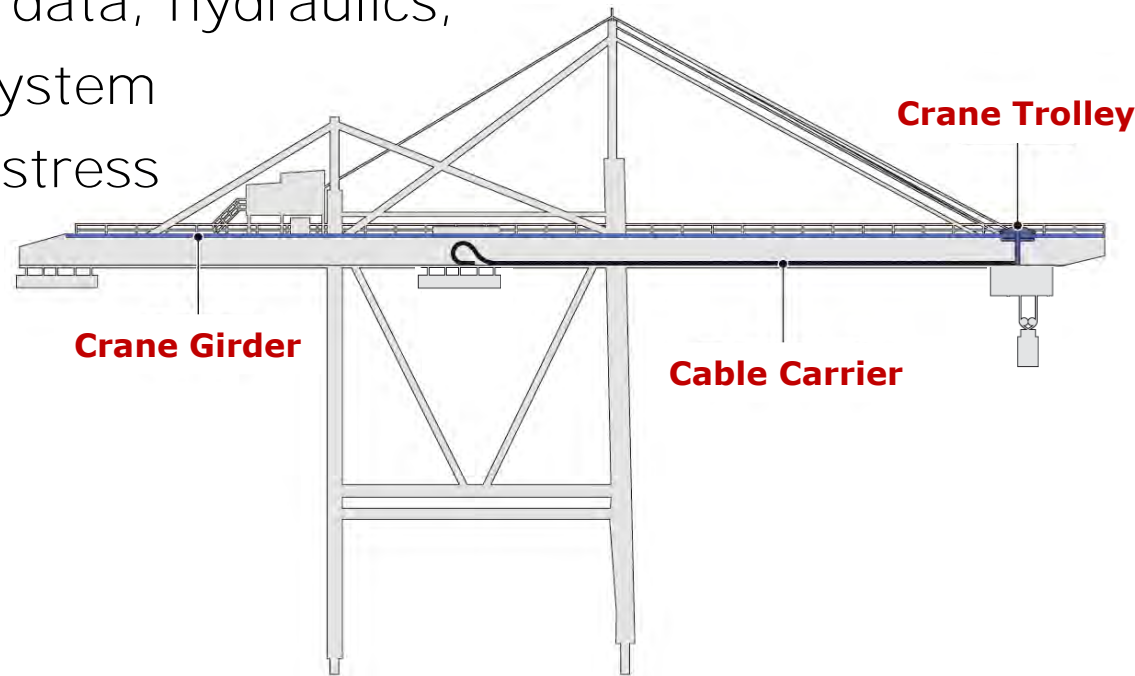
Spreader



Cable Carriers for crane applications

benefits for crane builder and enduser

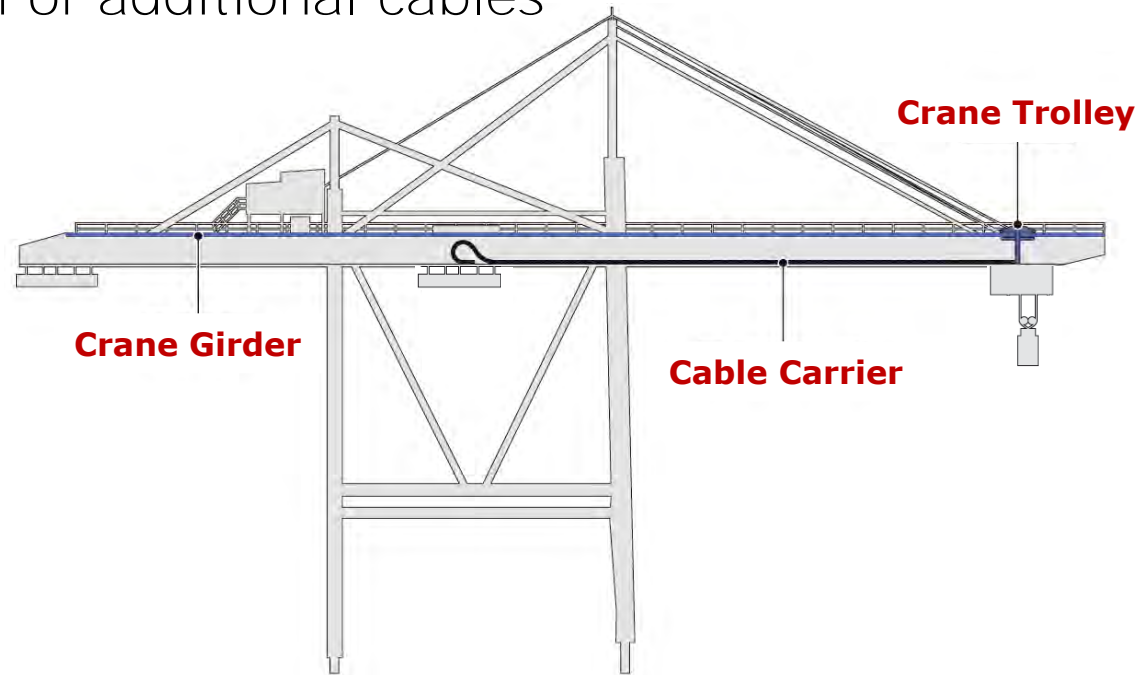
- Space saving design
- No loop station and also no additional steel structure for loop station
- No additional drives necessary
- No control system necessary
- All kind of media (power, data, hydraulics, pneumatics, ...) in one System
- No addition mechanical stress to the cables
- Short cable length



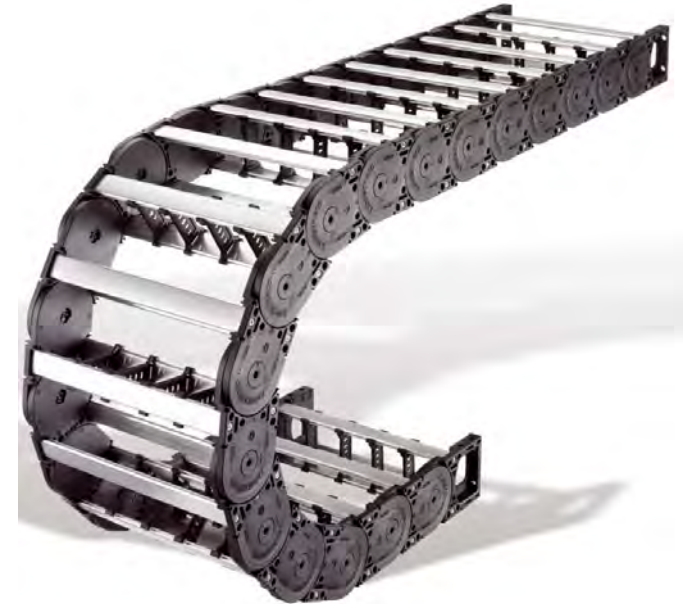
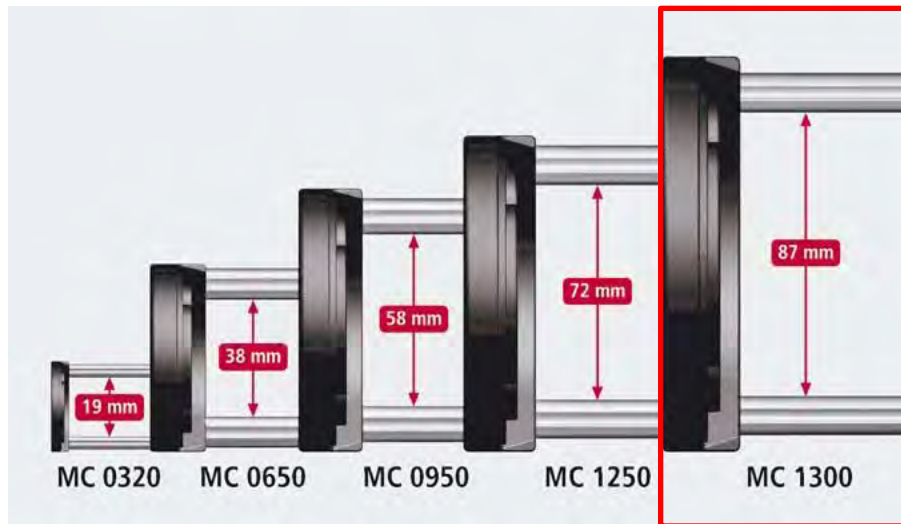
Cable Carriers for crane applications

benefits for crane builder and enduser

- Low maintenance extravagance will reduce the crane downtimes (visual inspection)
- Wind an weather resistant system
- Synchronous run of trolley and cable carrier
- Quick an easy installation of additional cables
- No tangling cable loops
- Safe data transfer with light velocity



MC cable carrier with screwed RM/RMF-stays



- Robust design, suitable even for the toughest ambient conditions
- Ideal for extremely long travel lengths
- Offers all the well-known benefits of the MC Series!
- No fixed inner width



MC cable carrier with screwed RM/RMF-stays

- Heavy Duty designe – special developed for wide carriers with large additional loads.
- Easy to assemble and disassemble.
- Easy to open from both sides - unlocks with a regular allen key.
- Large support area for low cable wear.
- Suitable for stiff cables/hoses with big diameters.
- Sea-/saltwater and UV resistant.
- Heavy Duty-RMF crossbars specially designed for the MC1300 solid and safely locked by locking screws.



MC cable carrier with screwed RM/RMF-stays



Free span tests



Bending moment tests



Push-pull forces tests



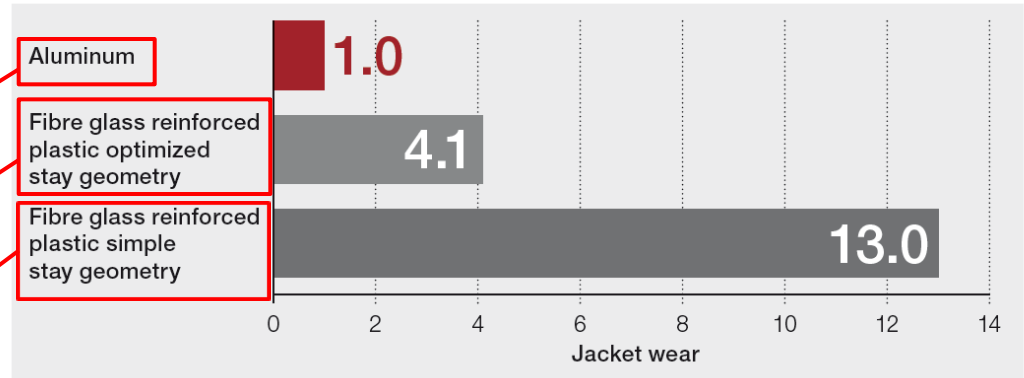
Long span tests

All necessary short and long term tests have been performed in our laboratory!

Every Energychain and every cable has to pass a strict test-series before we give our approval.

With this data in combination with our experience out of the field we are able to offer safe systems for all

Aluminum stays give the best possible cable protection



Aluminum cross bars – the perfect material to minimize the wear of the cable outer jacket.

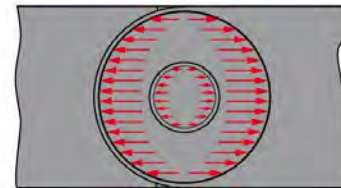
Jacket wear test at our Kabelschlepp Test Area

M Series Stroke System

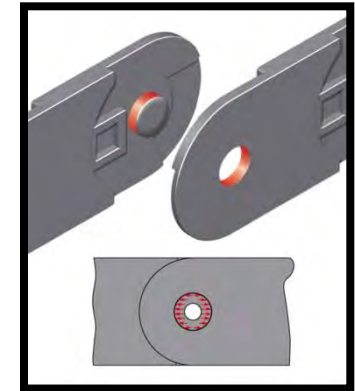
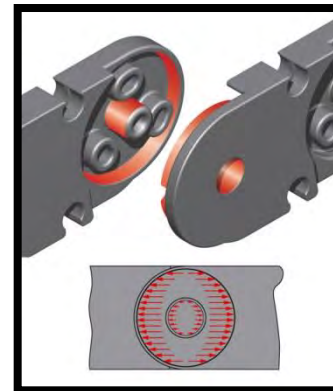
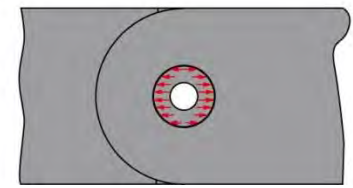
- Enclosed stroke system not sensitive to dirt/contamination
- Transmission of the push-pull forces occurs over the complete optimized hinge system instead of with a pin-hole joint.



2 disc joint



Pin-hole joint

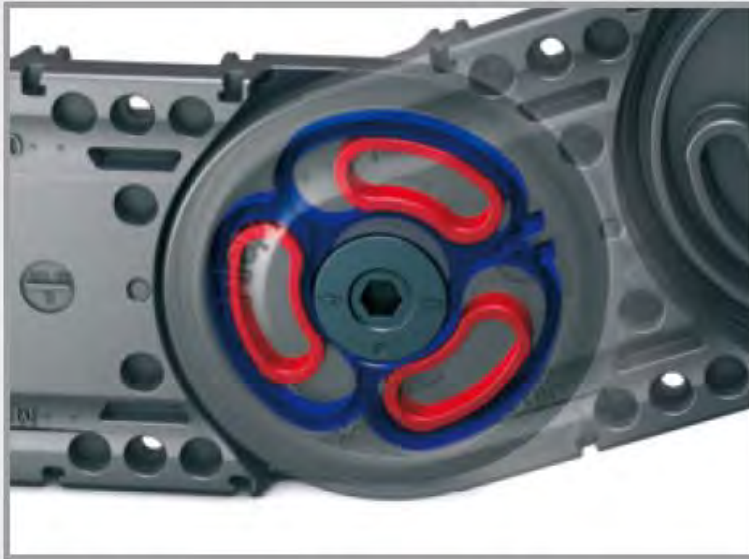


Advantages:

1. Reduced link wear
2. Higher admissible forces
3. Not affected by dirty environments
4. Longer cable carrier life

M Series Locking Bolts

Safe running design with!!!



**Solid plate construction,
enclosed impact system**

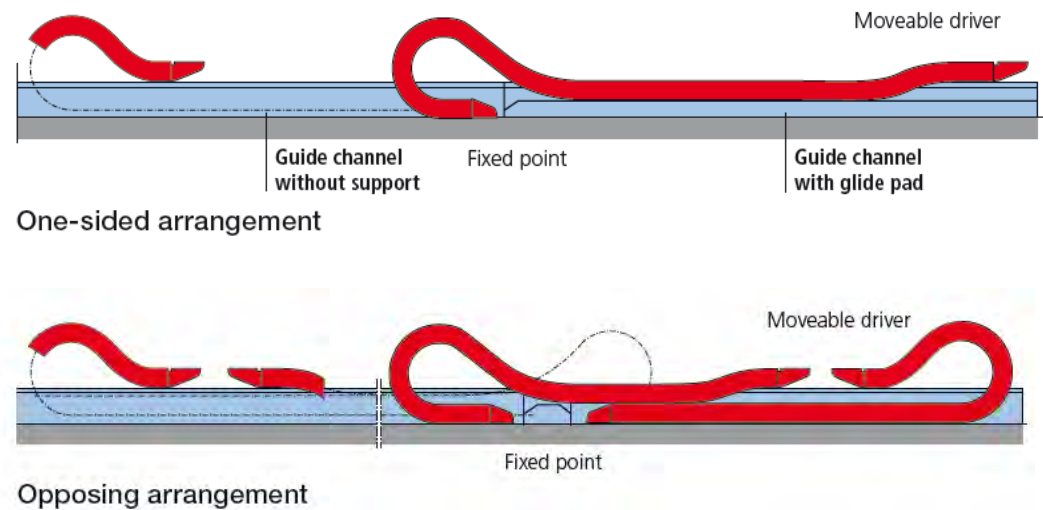


**Easy-to-fit with locking
bolts**

Even in case that some Locking Bolts are not installed the system is running safely until the Bolts will be installed!!!

Off-road Glide Shoes for the M-Series

All gliding and rolling applications are affected by wear. To extend the lifetime of a cable carrier, Kabelschlepp developed **exchangeable glide shoes**.

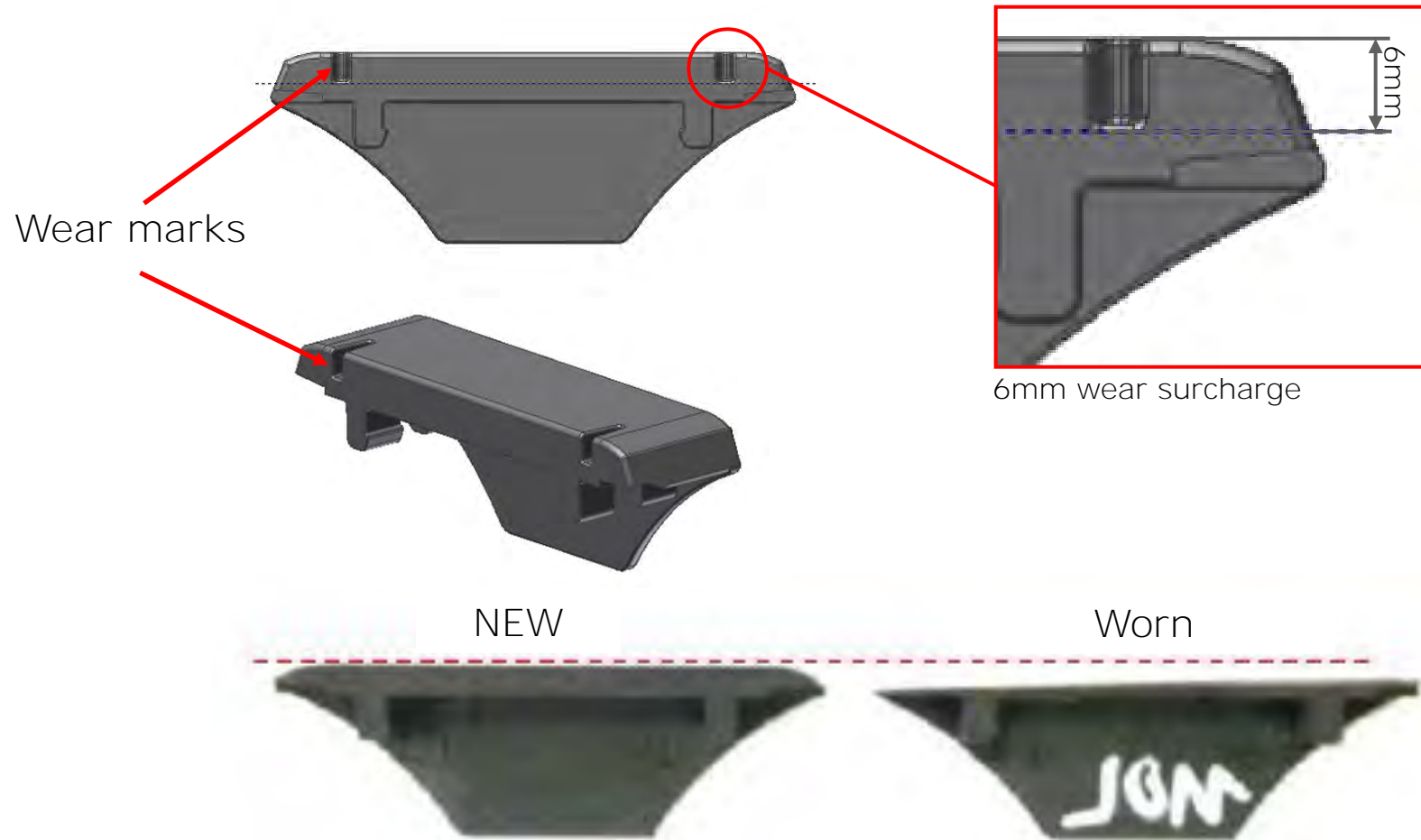


Biggest advantage:

Instead of changing the whole cable carrier by disassembling it on-site, only the attached glide shoes need to be replaced. The glide shoes can be removed with a normal screwdriver. Replacing one glide shoe takes only a couple of seconds.

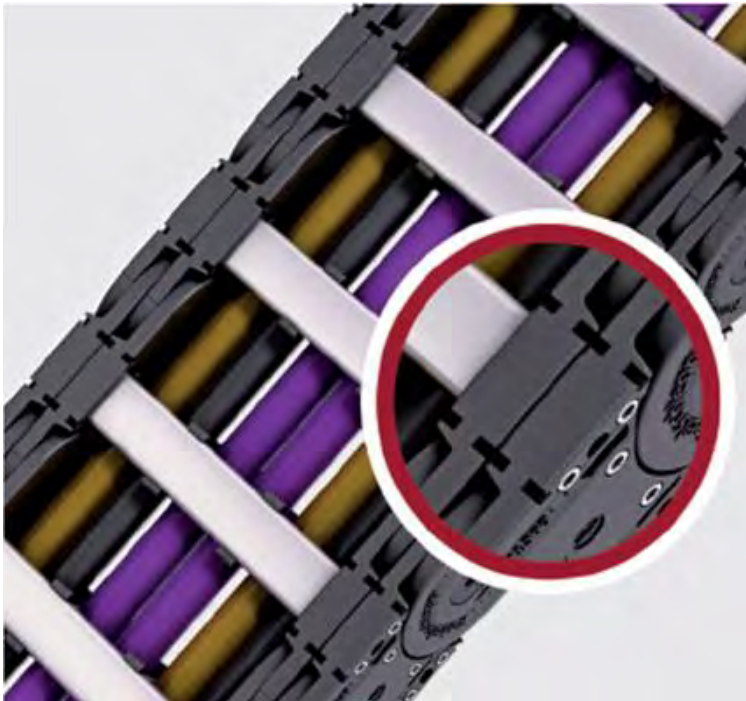
Glide Shoes for the M-Series

Maintenance and inspection friendly design thanks to visible wear marks!



MC1300 double side band: For large additional loads and 250m + travel lengths

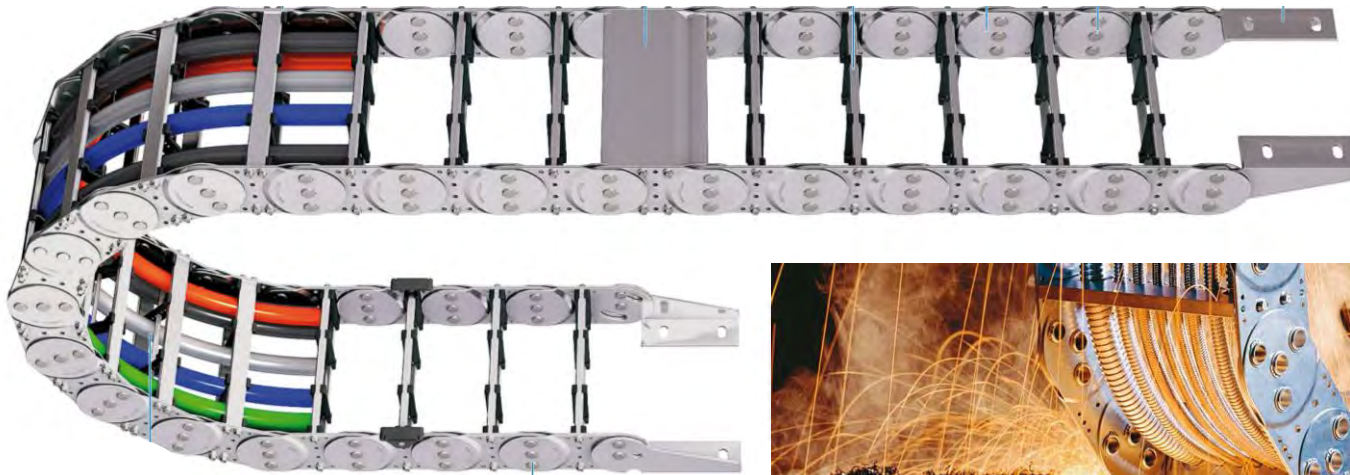
- Loads up to 130 kg/m
- High torsional rigidity and lateral stability
- Long service life



EXTREME applications

Steel Cable Carriers

- Robust design for heavy mechanical loads,
- high additional loads and long unsupported lengths possible,
- best suited for extreme and particular environmental influences,
- heat-resistant.

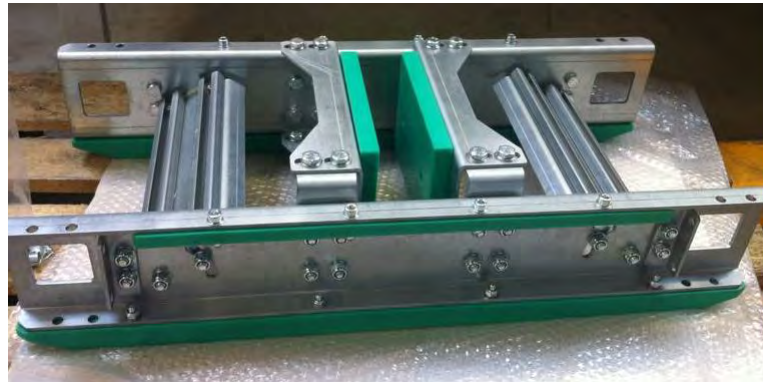


Metal parts

Guide channels



Driver sledges



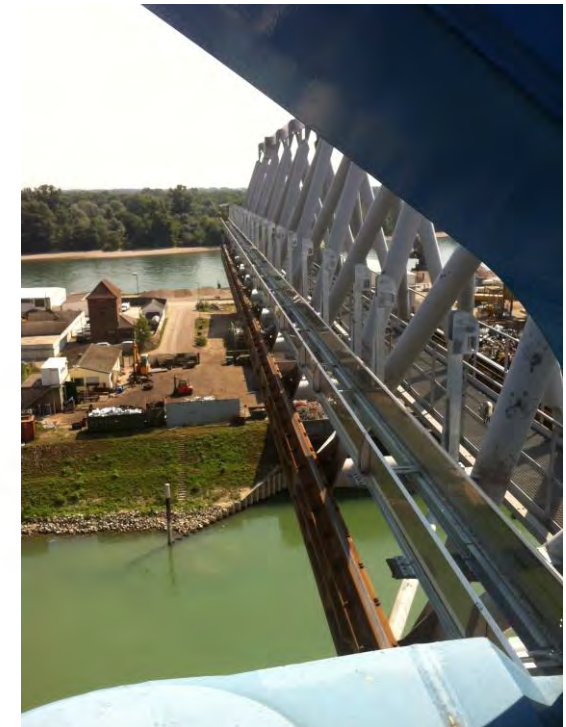
Strain relief



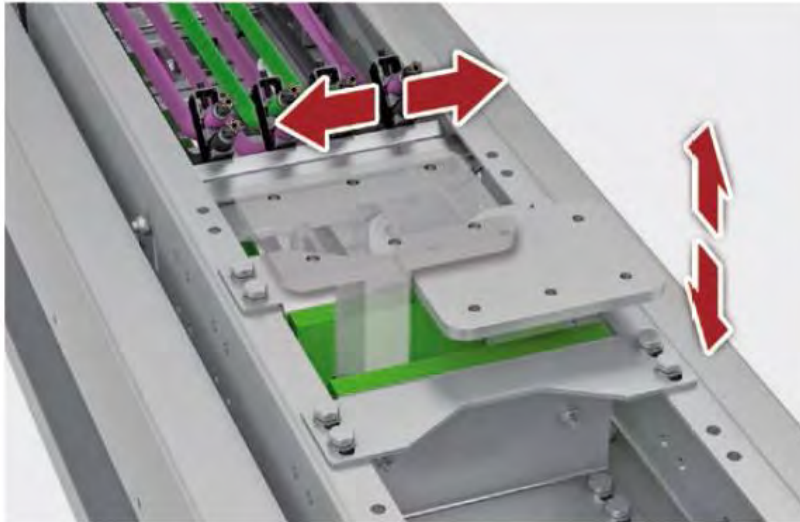
Guide channel

Advantages

- **Standardized** for all M Series cable carriers,
- **Available** in galvanized steel and stainless steel,
- **Heavy Duty design** with reinforced brackets and sideparts,
- **Preassembled** delivery,
- **No welded parts** – No heat affected zones,
- **No weldseams** – No cracks because of vibrations

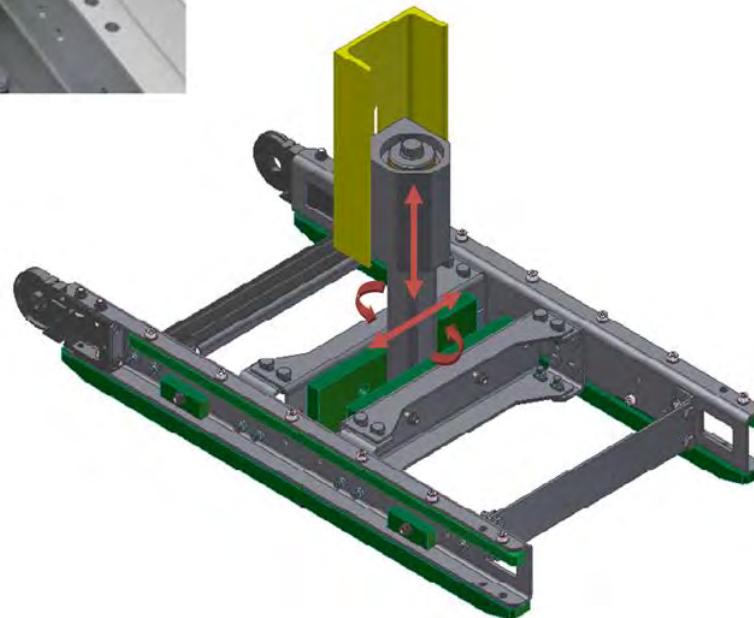


Driver sledge and rotary insert



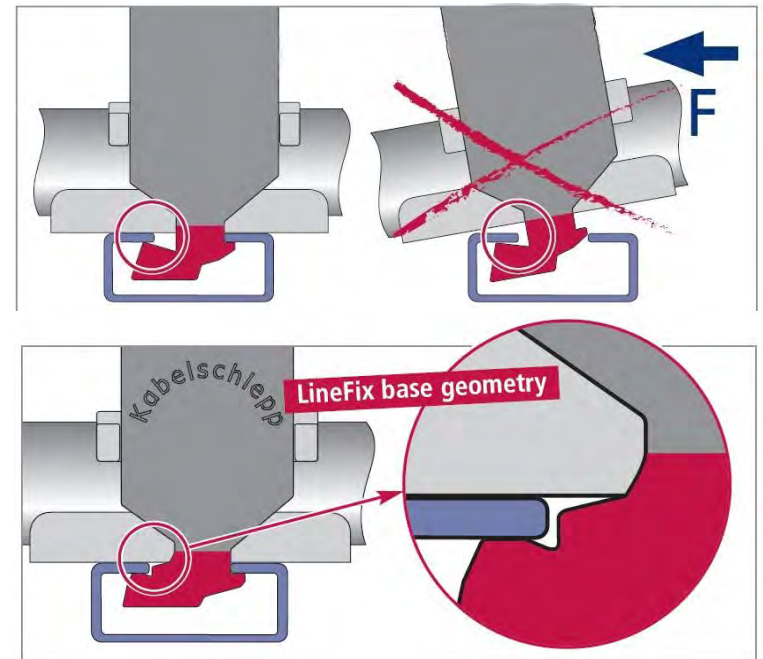
Purpose of a driver sledge

- Compensate vertical/horizontal misalignment
- Compensate torsional forces



Line-Fix Saddle Clamps

- Clamps, screws made of steel or stainless steel
- Optimized base geometry
- Plain design with retaining ribs
- Label visible, even after installation
- Multi-layer arrangement possible
- Fixed with a defined torque

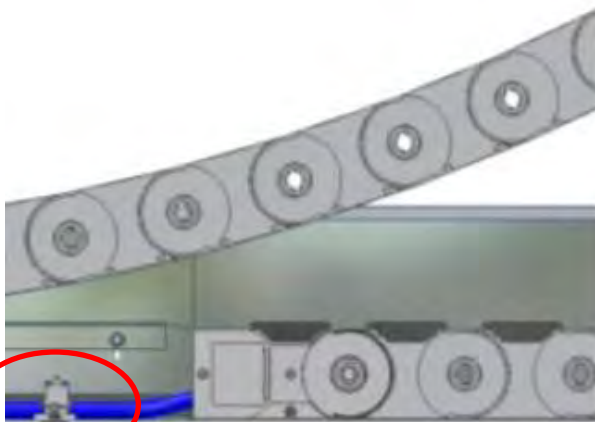
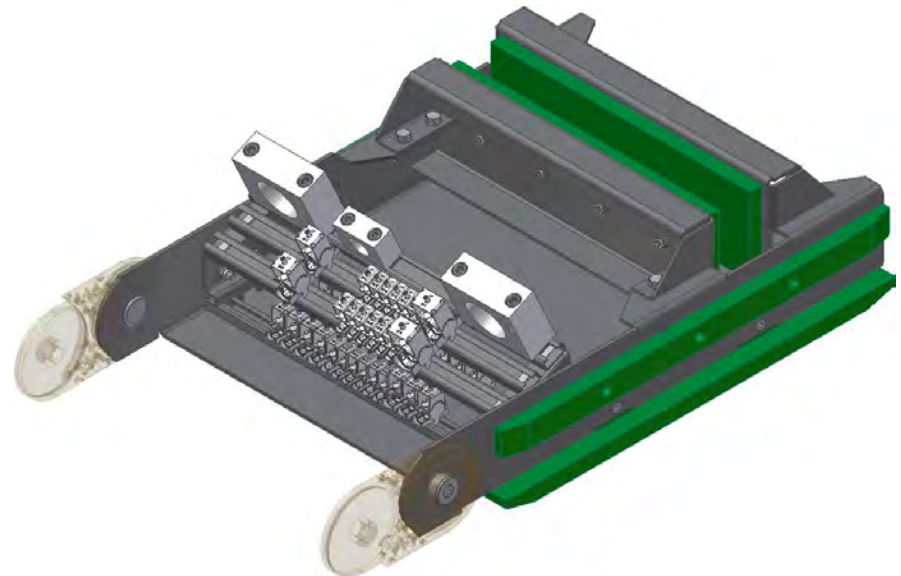
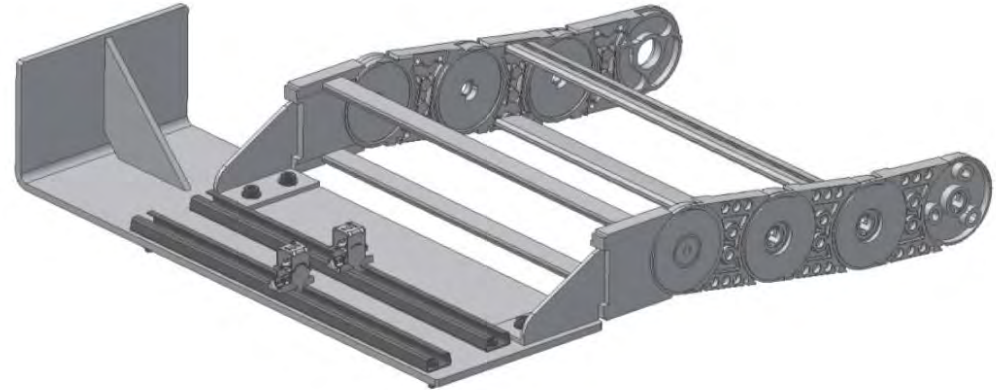


Possible strain relief solutions for fixed and moving points

Fixed point



Moving point



TRAXLINE Cables for Motion



DATA cables

POWER cables

CONTROL cables

OEM SYSTEM cables

BUS-/fiber optic-/coaxial cables

TRAXLINE Cables for Motion

Made for use in cable carriers

- **200 Series:** PVC outer jacket, layered stranding
- **400 Series:** PVC outer jacket, bundled stranding
- **700 Series:** PUR outer jacket, bundled stranding

Up to **2 million** motion cycles!

Up to **25 m** travel length!

Up to **4 million** motion cycles!

Up to **50 m** travel length!

Up to **7 million** motion cycles!

Up to **500 m** travel length!



DATA cables

POWER cables

CONTROL cables

OEM SYSTEM cables

BUS-/fiber optic-/coaxial cables

High-Flex Cables – 700 series

Bundled stranding, usable between -30 to +90°C



Up to **7 million** motion cycles!

Up to **500 m** travel length!



Core insulation
 KS-PP
 bundled stranding
 (> 8 cores)

Developed for

- systems engineering and mechanical engineering
- crane and conveyor equipment
- power and supply cable
- extremely heavy loads

Properties

- oil-resistant
- UV-resistant
- RoHS-conform
- halogen-free
- CFC-free
- silicone-free
- flame-retardant
- ozone-resistant



Outer jacket
 KS-PUR
 pressure extruded,
 hi-flex design, extremely
 abrasion-resistant



Inner jacket
 KS-TPE
 valley-sealed,
 pressure extruded,
 hi-flex design



Jacket colour black
 ozone-resistant
 UV-resistant



Overall shield
 continuous bending
 hi-flex, tin-plated
 copper braiding for
 smallest bend radii

High-Flex Cables – 700 series

Bundled stranding, usable between -30 to +90°C

Wear test in a cable carrier



after 7 million cycles, the cables are in good condition and the test is still running!

Heat resistance of TRAXLINE cables

- 7 million cycles guaranteed at a temperature range of -30° to + 90° C,
- Higher temperatures are possible,
- KABELSCHLEPP cables and cable carriers used for 18 months at 120° C
- KABELSCHLEPP offers a 145° C heat resistant cable for high temperature applications



Total Trax Turnkey System for your crane Application

- Full harnessed Systems with System warranty.
- From the first sketch to the final check everything from one supplier.
- Full System documentation.
- Installation service on site.





References



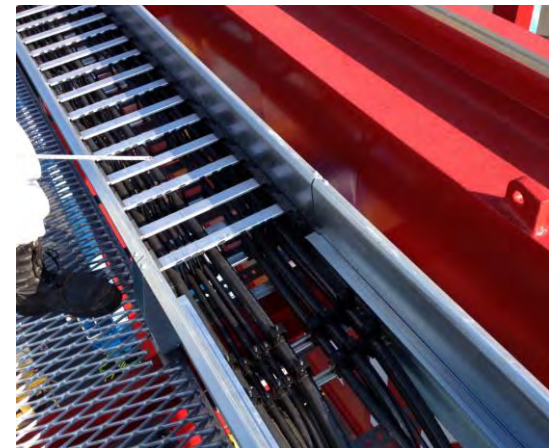
RTGs for



Specifications:

Company: Mitsui Engineering & Shipbuilding
Amount: 29 sets (since October 2013)
Type of crane: RTG
(Turkey, Japan, USA, Malaysia)

Travel length: approx. 20 m
Speed: 1,7 m/s
Acceleration: 0,3 m/s²
Additional load approx. 12 kg/m
Cable carrier: MC1300.320-RMF-320-12220



MES RTGs for



RTG for



Specifications:

Company: ZPMC Group, Shanghai
Place of usage: within China
Amount: several sets
Type of crane: RTG
Port environment

Travel length: up to 30 m
Speed: 1,2 m/s
Acceleration: 0,5 m/s²
Additional load up to 12 kg/m



RTGs for



Trans Gulf Port Cranes L.L.C

عبر الخليج لرافعات المرافئ ذ.م.م

Specifications:

- Company: Trans Gulf Port Crane, Abu Dhabi
Amount: 13 Sets
Type of crane: Rubber Tyred Gantry (RTG)
Port environment
- Travel length: 17,5 m
Speed: 1,2 m/s
Acceleration: 4 m/s²
Additional load: 12 kg/m
Installation:
Cable carrier: MC0950.352-RS-260





Framecontract for RTGs with

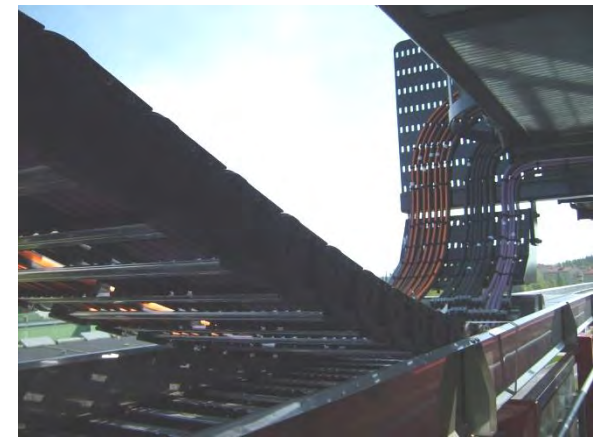
Specifications:



Company: Cargotec
Place of usage: Finland
Amount: Framecontract
Type of crane: Rubber Tyred Gantry (RTG)
Port environment

Travel length: 19,1 m
Speed: 1,17 m/s
Acceleration: 0,5 m/s²

Test RTG in Winter operation



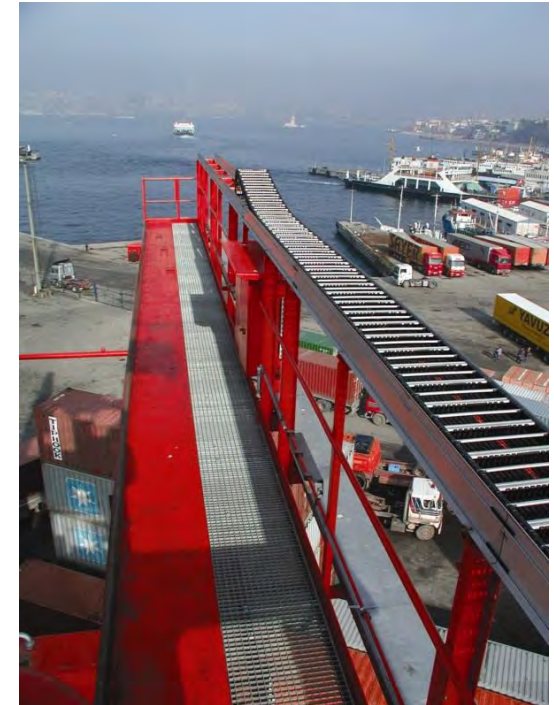
RTGs for NIKMNOELL
SPECIAL CRANES

Container Terminal Istanbul , Turkey

Specifications:

- Type of crane: 26 Rubber Tired Gantry Crane (RTG)
Port environment
- Travel length: 18,40 m, center fixed point
- Speed: 1,17 m/s
- Acceleration: 0,3 m/s²
- Additional load: 10 kg/m
- Installation: 2000

KABELSCHLEPP MC 0950.429-RS/RM-260-10.545

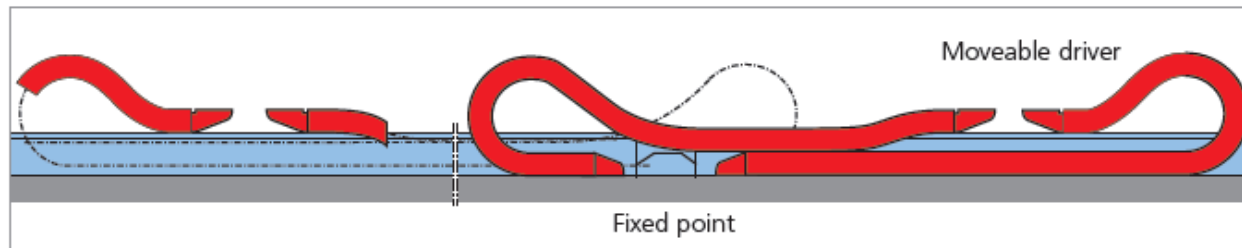
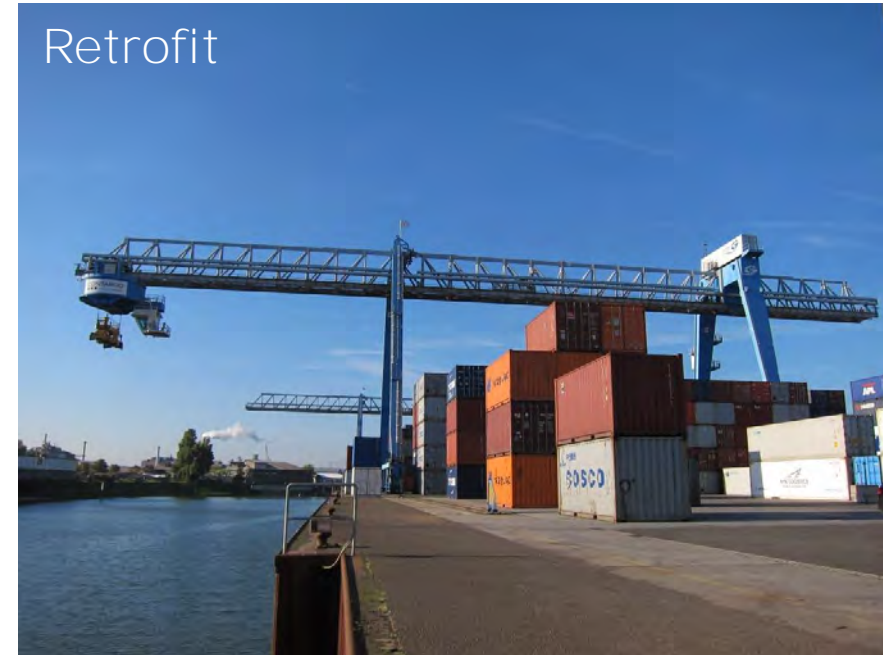


CONTARGO®

STS for ■■■ trimodal network

Specifications:

Company:	CONTARGO, Ludwigshafen
Amount:	1 Set
Type of crane:	STS Inland port
Travel length:	108 m
Speed:	2 m/s
Acceleration:	1 m/s ²
Additional load	17 kg/m
Installation:	
Cable carrier:	MC1300.335-RMF-360-57200



Opposing arrangement

CONTARGO®

■ ■ ■ trimodal network

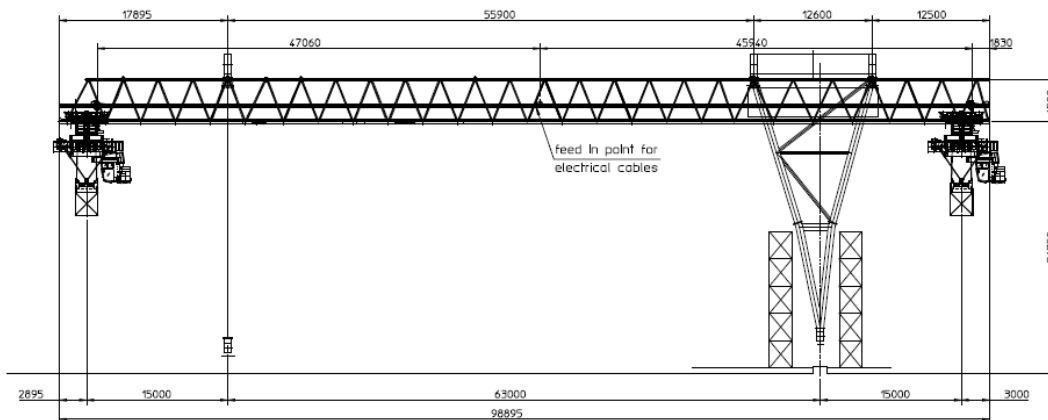
Retrofit on a Gottwald STS-crane



RMGs for Liebherr Container Cranes Ltd.

Specifications:

Company:	Liebherr Container Cranes
Place of usage:	Vladivostok, Russia
Amount:	2 cranes
Type of crane:	RMG Crane
	Port environment, -40° C to +40° C
Travel length:	94 m
Speed:	2 m/s
Acceleration:	1,0 m/s ²
Additional load	12,2 kg/m
Cable carrier:	MC1250.300-RM-260-50500



Liebherr Container Cranes Ltd.

turnkey Totaltrax-
Systems for two
RMG's



RMG for Künz

Container Terminal Altenwerder (CTA), Germany

Specifications:

Amount:	52 Sets
Type of crane:	Rail-Mounted Gantry Crane (RMG) Port environment
Travel length:	32,30 m
Speed:	1,0 m/s
Acceleration:	0,3 m/s ²
Opposite Arrangement	
Additional load (divided among two carriers)	12 kg/m
Installation:	2001-2005



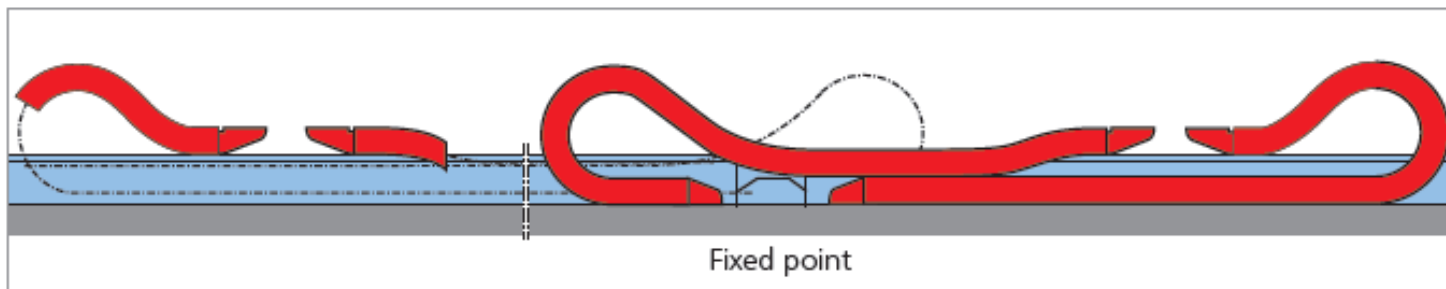


Retrofit Container Terminal Altenwerder
(CTA), Germany



stx Goliath Cranes

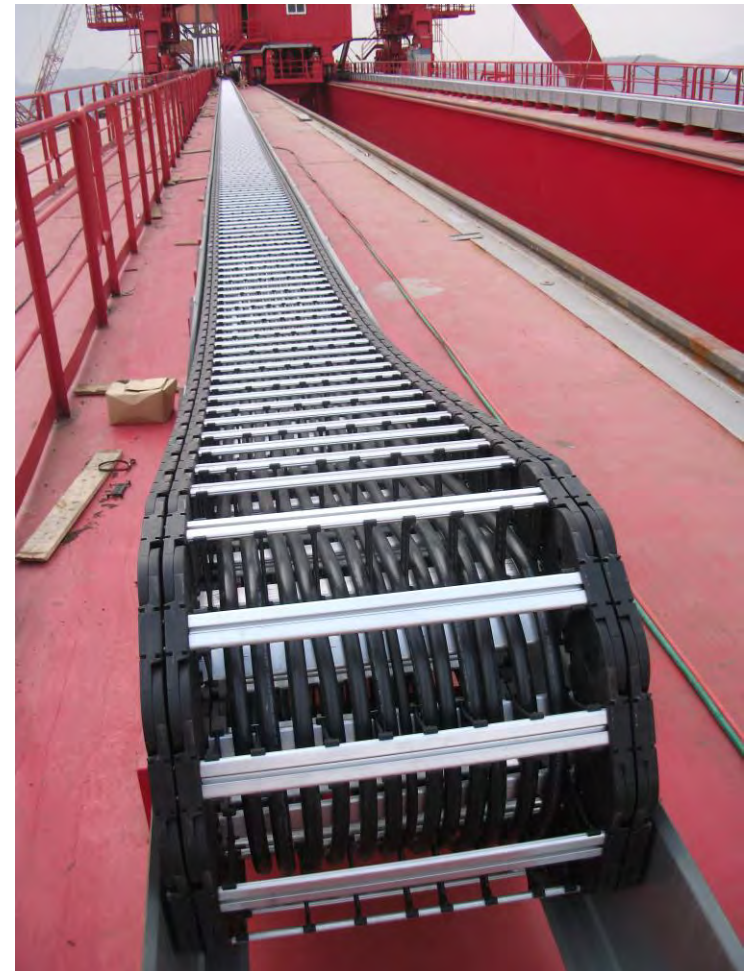
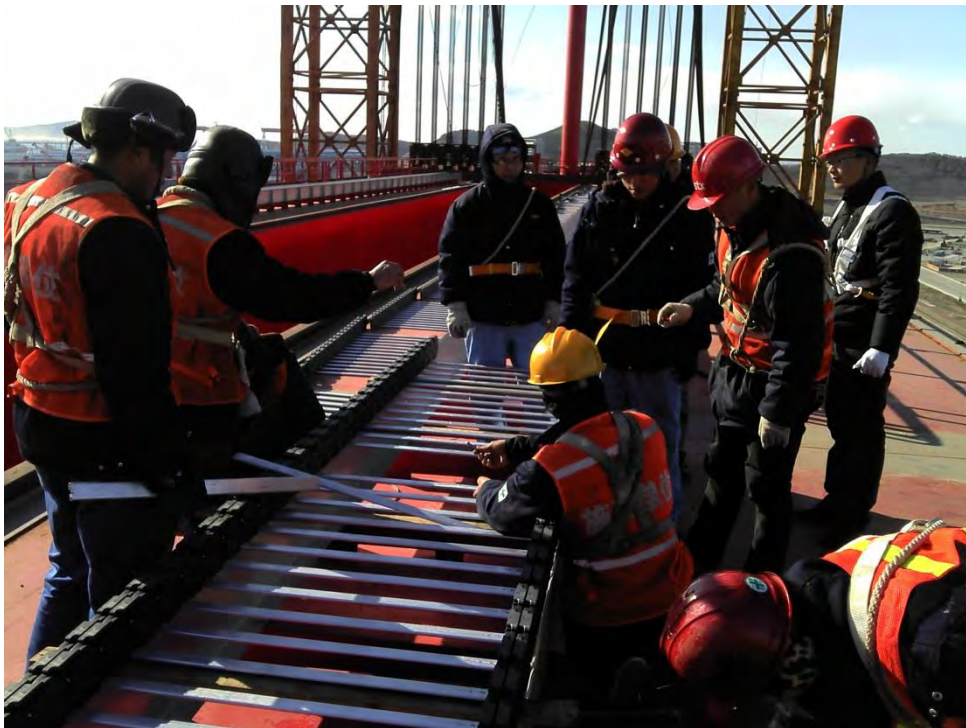
- STX Shipbuilding, Dalian (China)
- Feed for Upper und Lower Trolley
- Travel distance: approx. 250 m
Additional load: max. 50 kg/m
(distributed among two carriers)
- MC1300 with double-sidebands in opposing arrangement



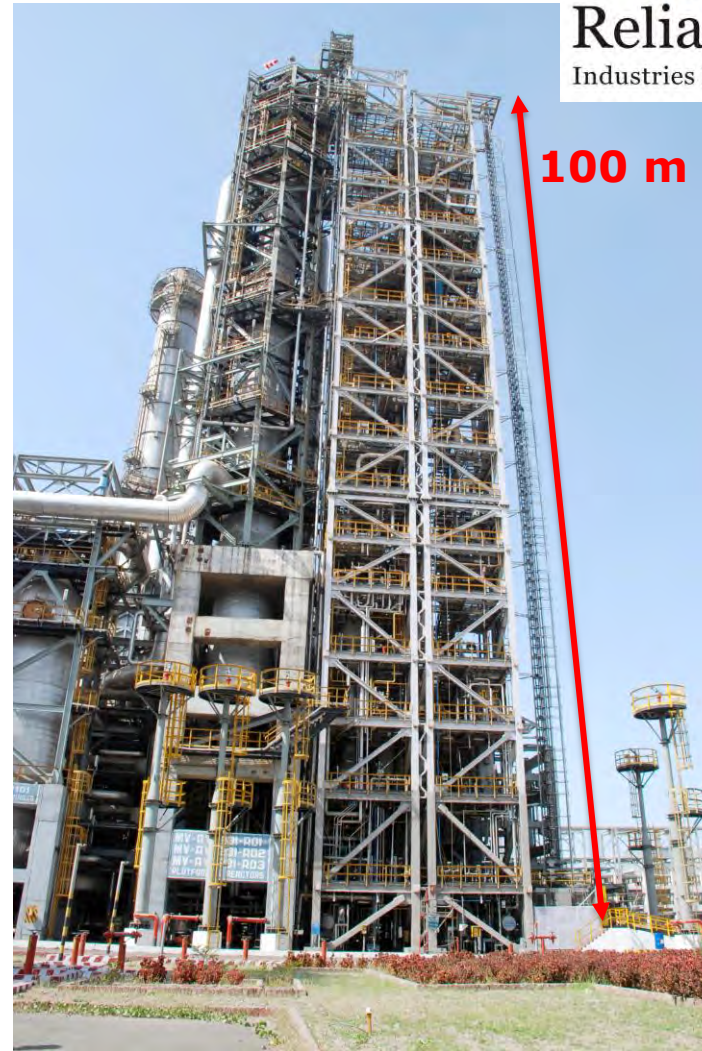
Opposing arrangement

stx Goliath Cranes

On site installation by supervision of an
KS-Engineer in Dalian (China)



- Cable carrier system for elevator.
- Close project management between Kabelschlepp India and Germany.




Reliance
Industries Limited

And many more.....



New development: RSC-System (Roller Supported Chain)

- Rolling instead of gliding
- 90% less force compared to a gliding System
- Quiet and less-vibration
- High travel speed and acceleration
- Minimum stress for cable carrier and cables
- Very long travels possible
- Easy to maintain
- Only visual inspection
- Easy Installation (self aligning)
- No fix distances of the support Structur necessary

**100% Rolling System!!!
the upper Run never
touches the lower Run**

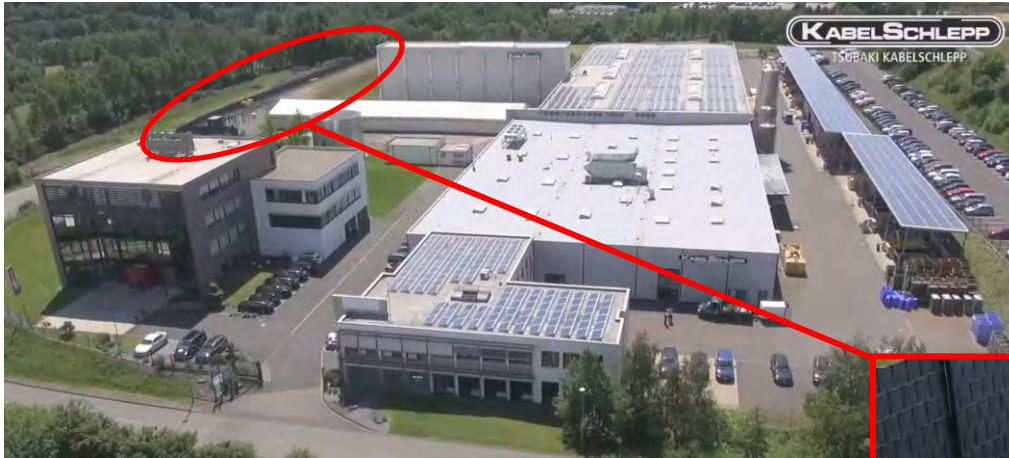


Tested at our full automatic crane Test-Center

New development: RSC-System

(Roller Supported Chain)

Proven under real conditions on outside test facility



- Test facility for 2 distinct systems
- Travel lengths of more than 100 m
- Test speeds up to 5 m/s
- Test under real weather conditions
- Automatic Test in 24/7



New development: RSC-System

(**R**oller **S**upported **C**hain)

Proven under real conditions on outside crane test facility



KABELSCHLEPP

TSUBAKI KABELSCHLEPP

Thank you
for your attention!