KABELSCHLEPP

CABLE & HOSE CARRIER SYSTEMS FOR CRANES

Innovation in Motion TSUBAKI

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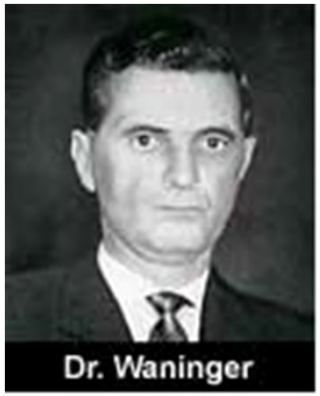
Tsubaki KABELSCHLEPP

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

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Wenden-Gerlingen Headquarters

Everything under one roof.

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

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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

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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

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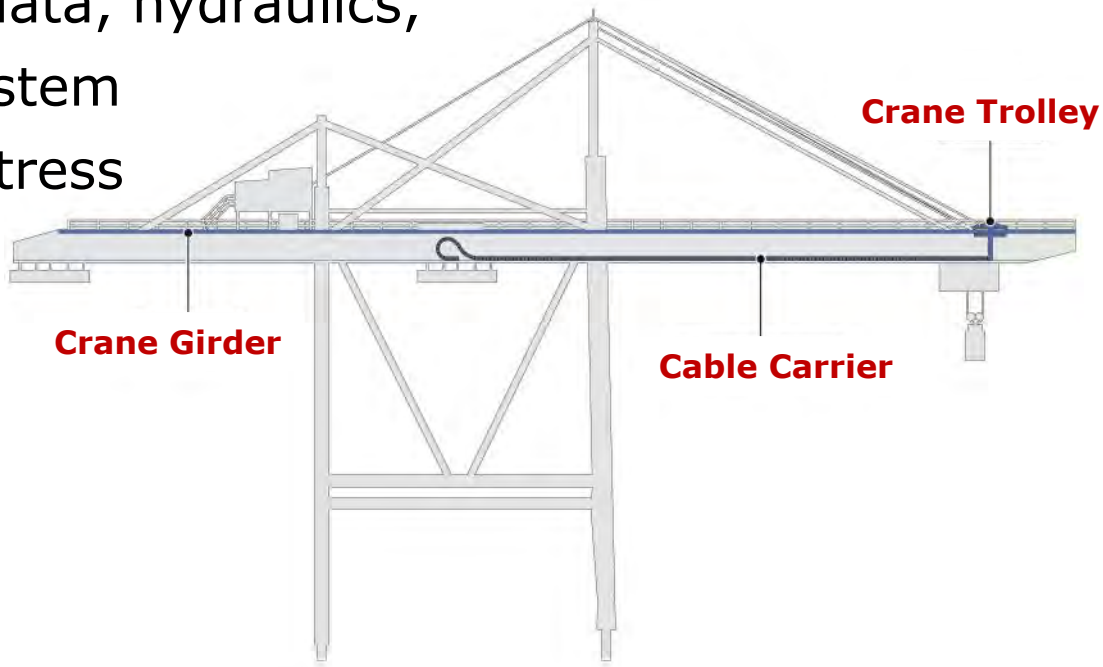
Cable Carriers for crane applications

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 adddition mechanical stress to the cables
- Short cable length



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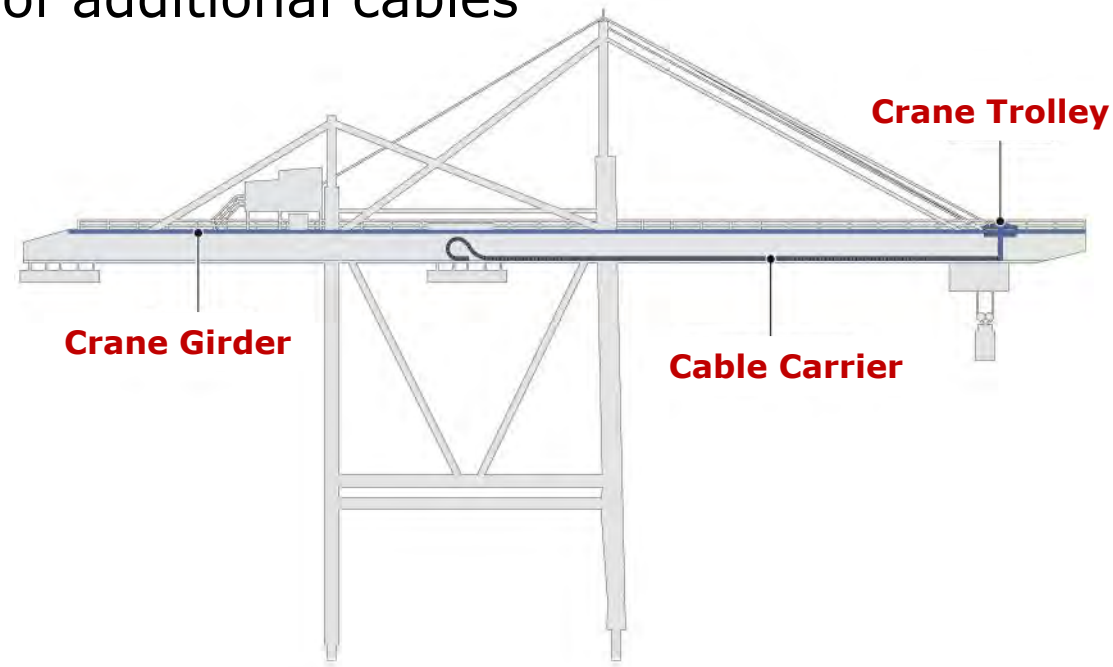
Cable Carriers for crane applications

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



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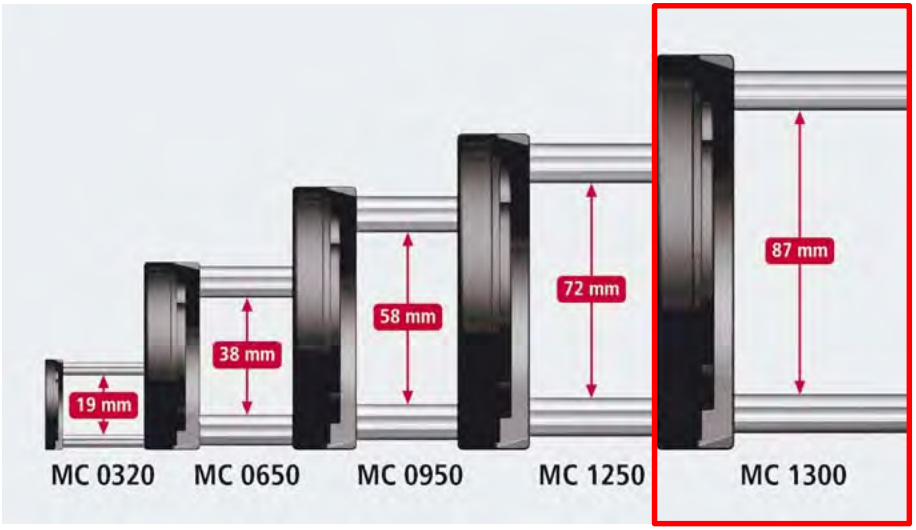
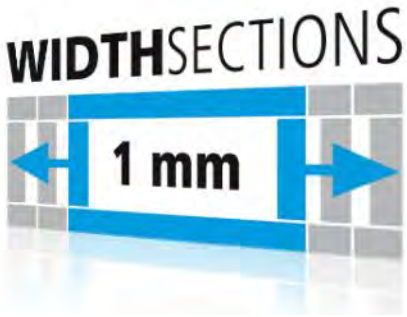
MC cable carrier with screwed RM/RMF-stays



- 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



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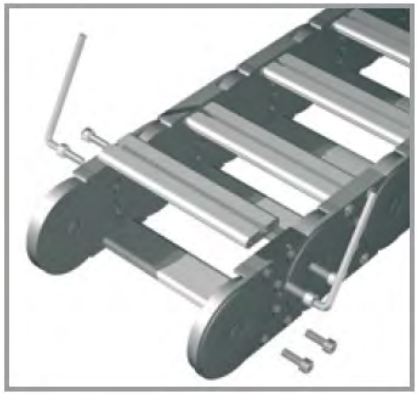
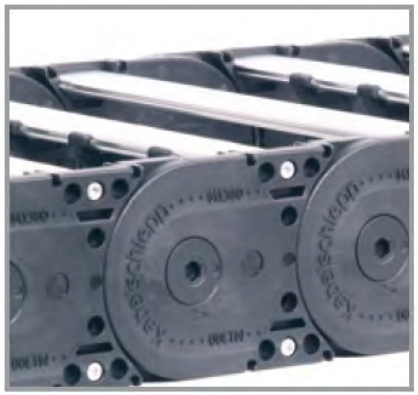
MC cable carrier with screwed RM/RMF-stays

- 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.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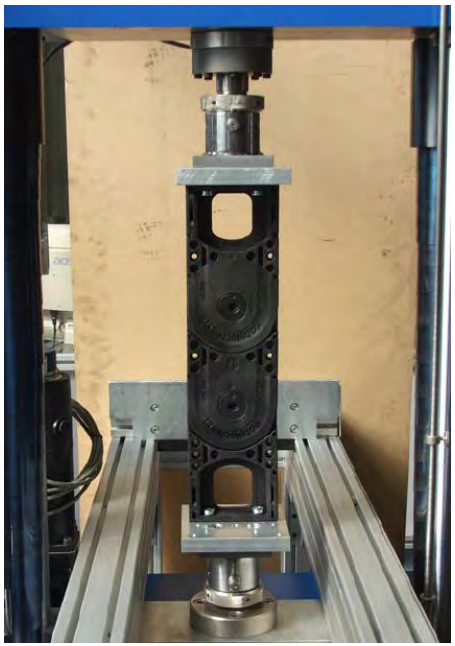
MC cable carrier with screwed RM/RMF-stays

Free span tests

Long span tests

Bending moment tests

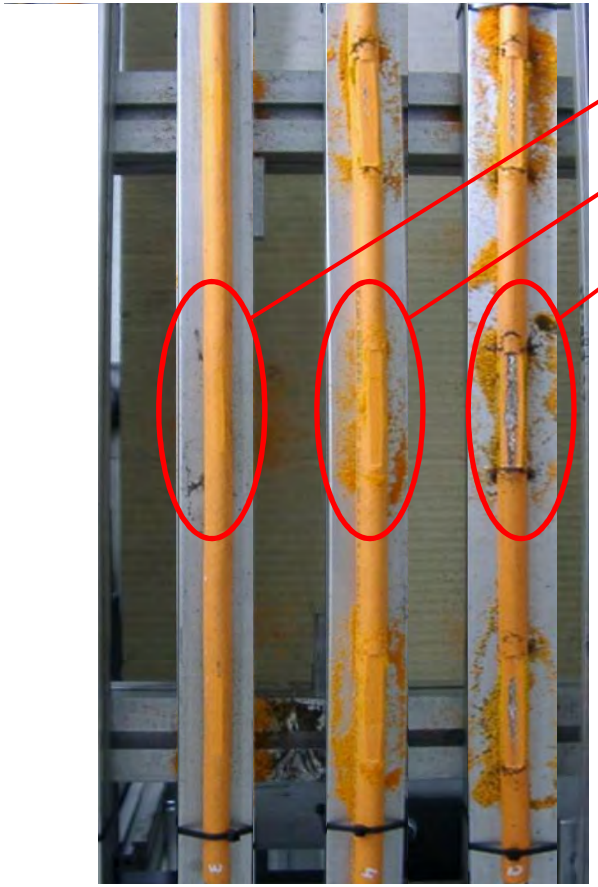


Push-pull forces tests

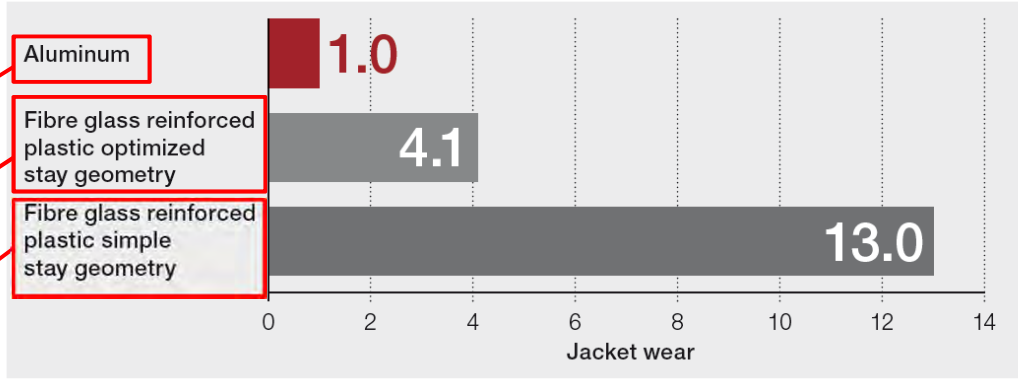
All necessary short and long term tests have been performed in our labratory!
Every Energychain and ervy cable has to pass a strict test-series before we give our approval.

With this datas 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



Jacket wear test at our
Kabelschlepp Test Area



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

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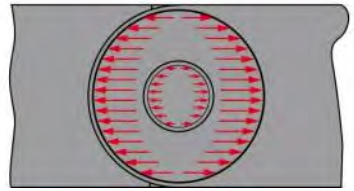
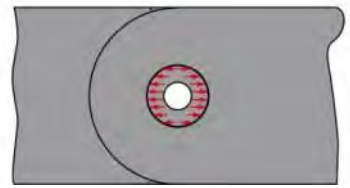
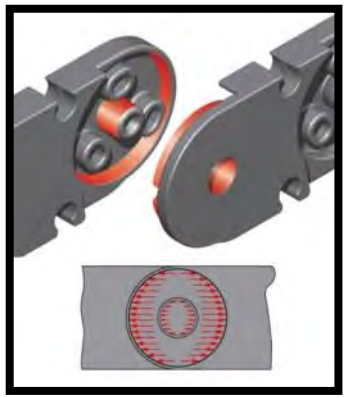
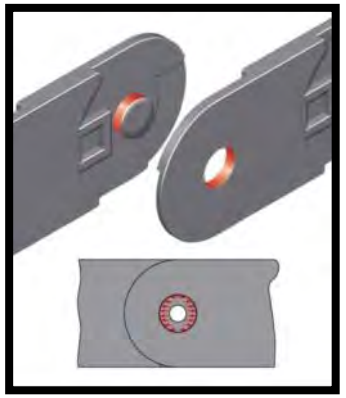
M Series Stroke System

- 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.









Advantages:

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

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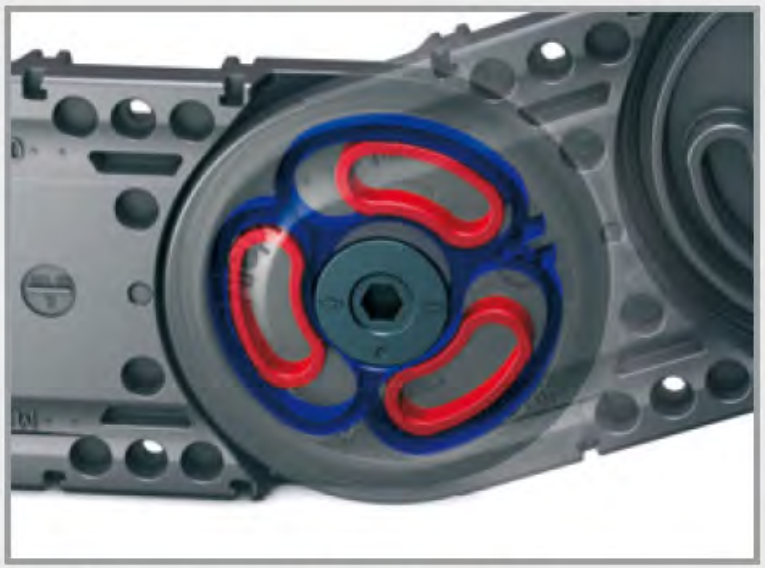
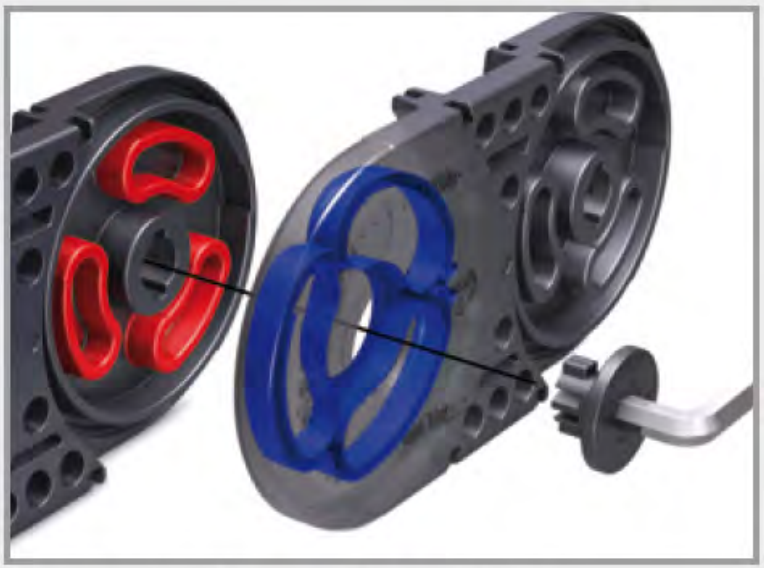
M Series Locking Bolts

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!!!

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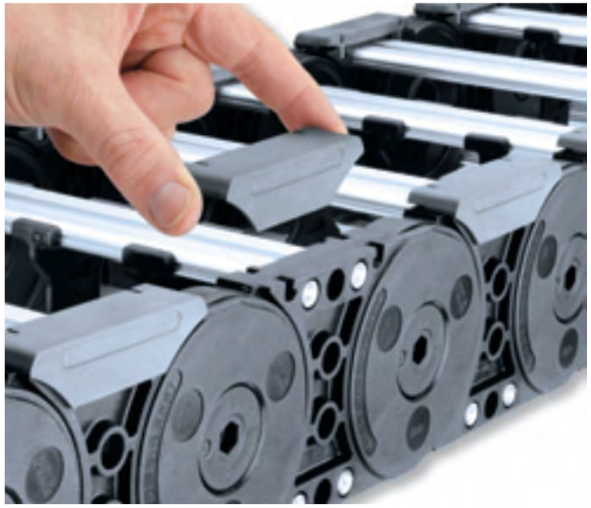
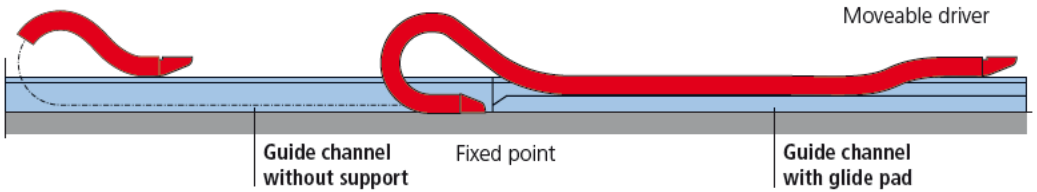
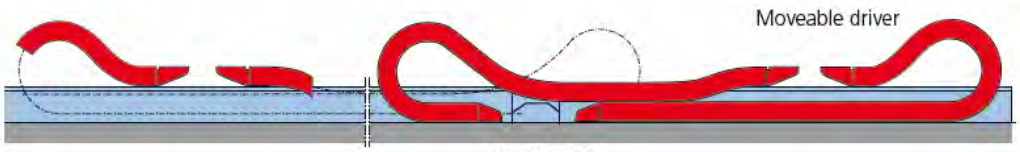
Off-road Glide Shoes for the M-Series

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





One-sided arrangement



Opposing arrangement

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.

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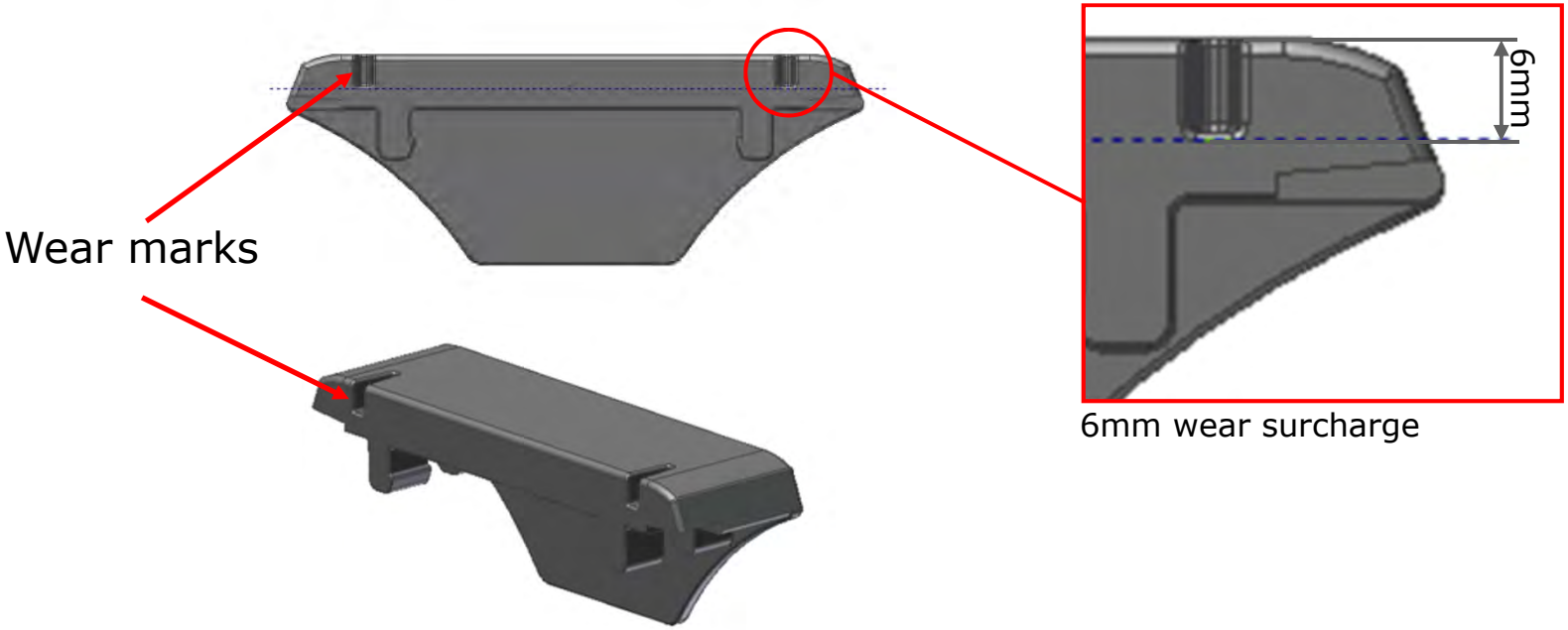
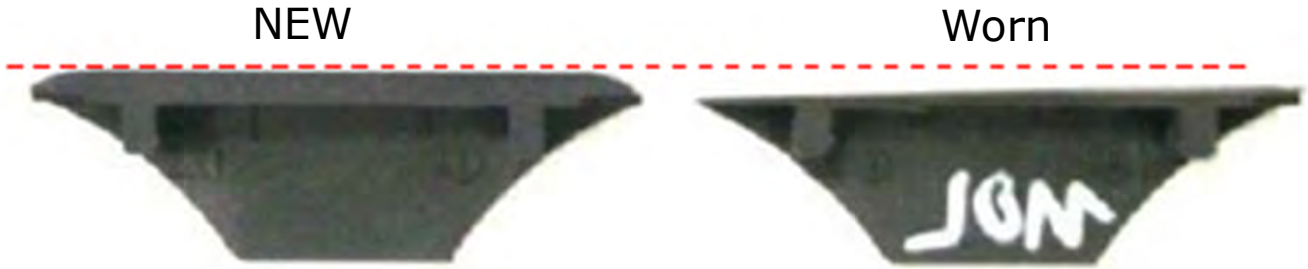
Glide Shoes for the M-Series

Maintenance and inspection friendly design thanks to visible wear marks!



6mm wear surcharge



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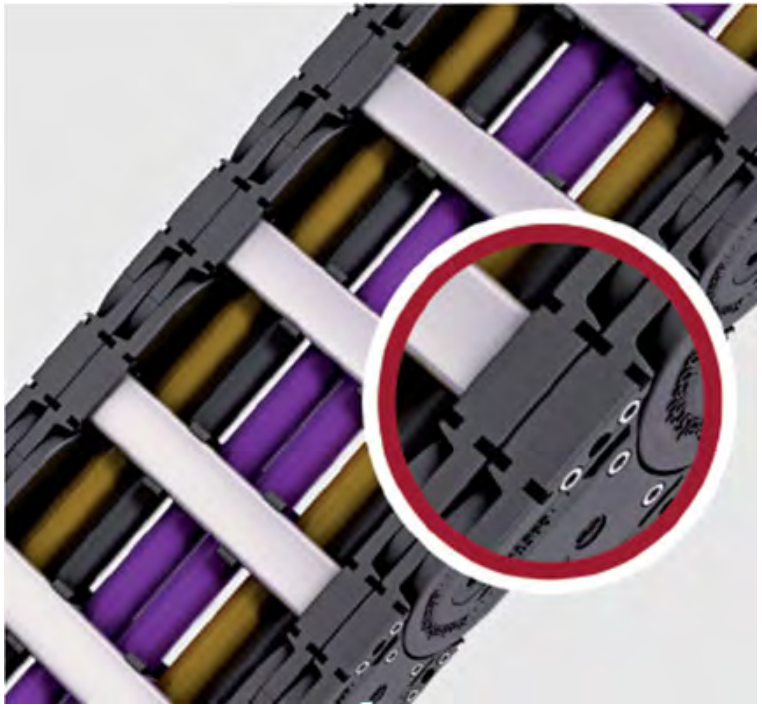
MC1300 double side band:
For large additional loads and 250m + travel lengths

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



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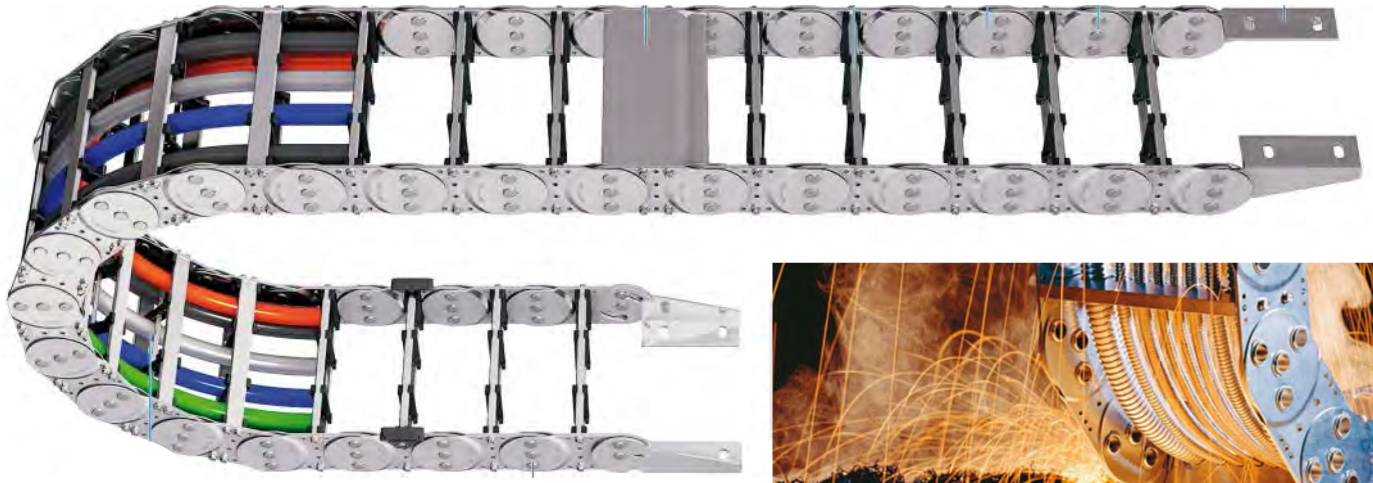
EXTREME applications

Steel Cable Carriers

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



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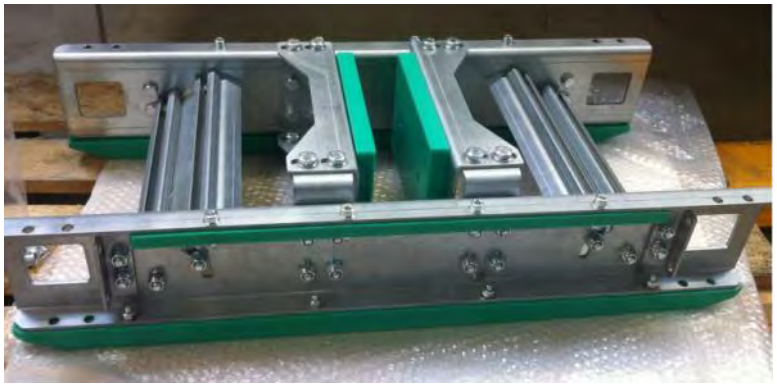
Metal parts

Guide channels

Driver sledges

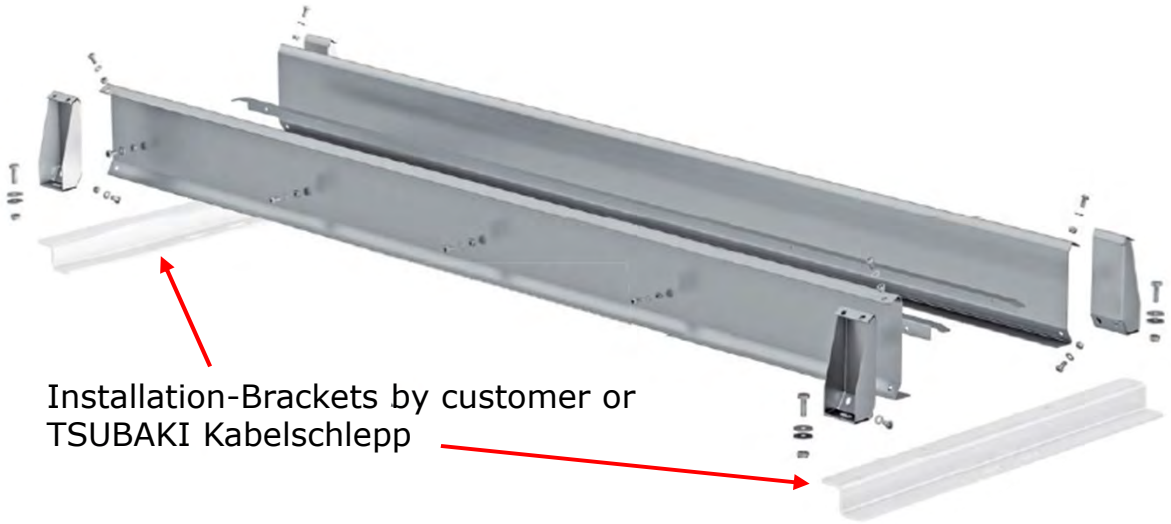


Strain relief

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



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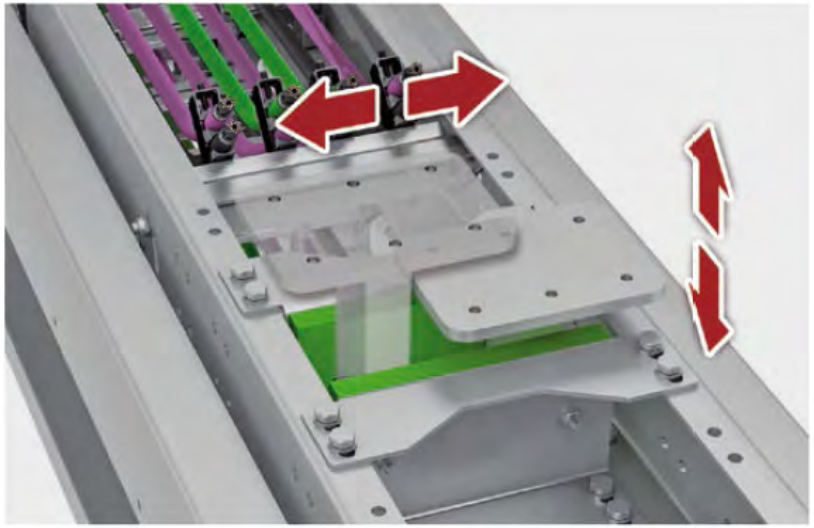
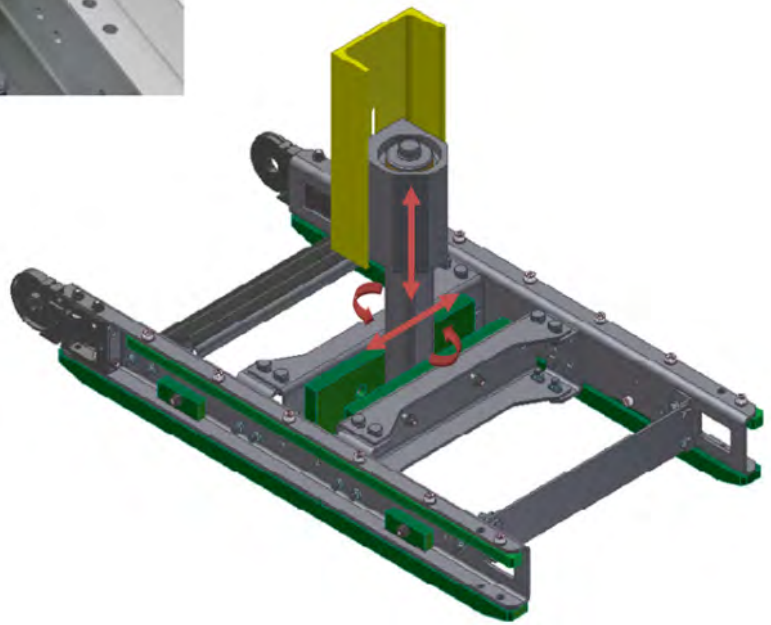
Driver sledge and rotary insert



Purpose of a driver sledge

- Compensate vertical/horizontal misalignment
- Compensate torsional forces



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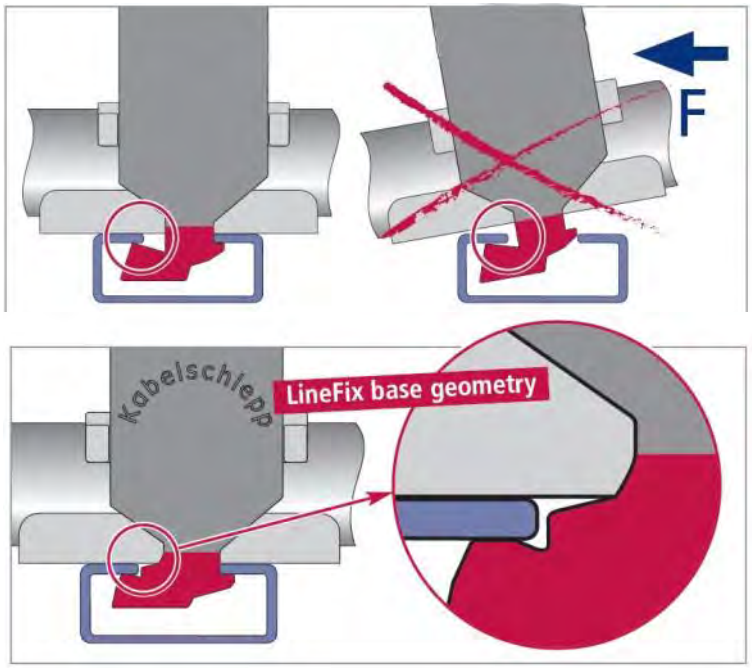
Line-Fix Saddle Clamps

- 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



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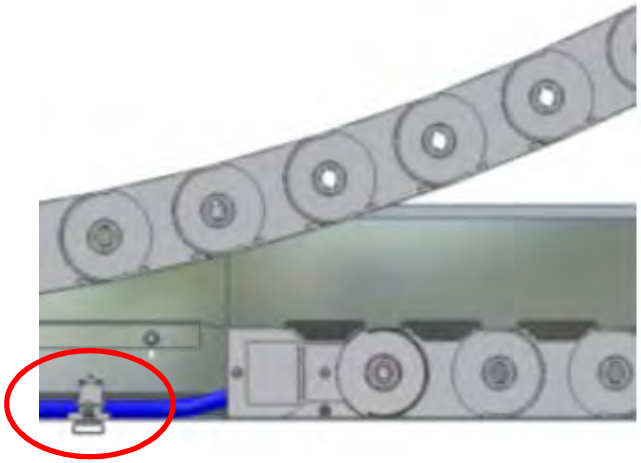
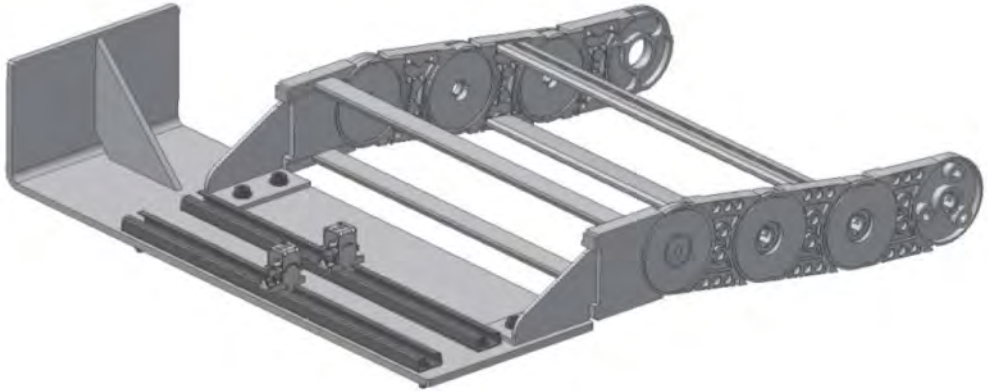
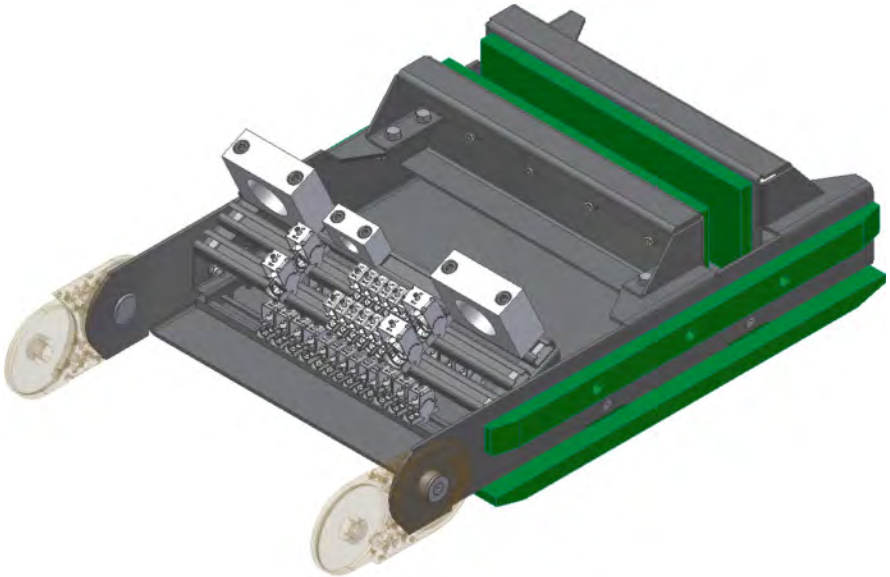
Possible strain relief solutions for fixed and moving points

Fixed point



Moving point





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TRAXLINE Cables for Motion

DATA cables

POWER cables

CONTROL cables

OEM SYSTEM cables

BUS-/fiber optic-/coaxial cables

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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

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High-Flex Cables – 700 series

Bundled stranding, usable between -30 to +90ºC

Up to **7 million** motion cycles!

Up to **500 m** travel length!

TSUBAKI KABELSCHLEPP cables for cable carriers

DESINA

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

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

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

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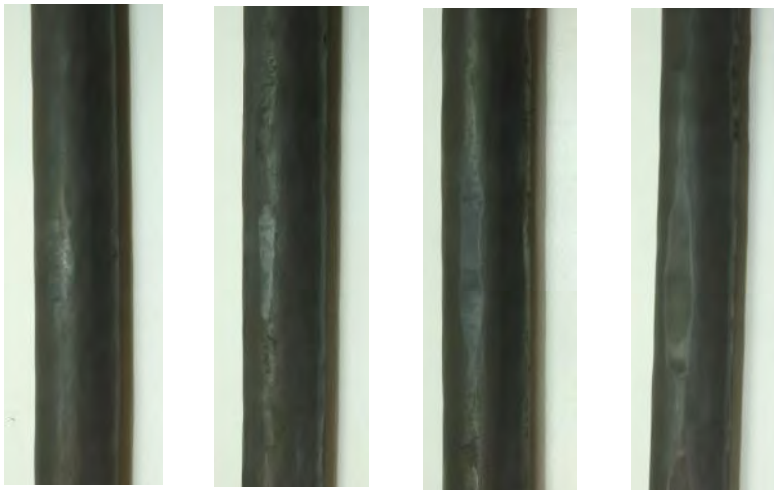
High-Flex Cables – 700 series

Bundled stranding, usable between -30 to +90ºC

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

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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.

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References

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RTGs for MES

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

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MES **RTGs for**

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RTG for ZPMC

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

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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

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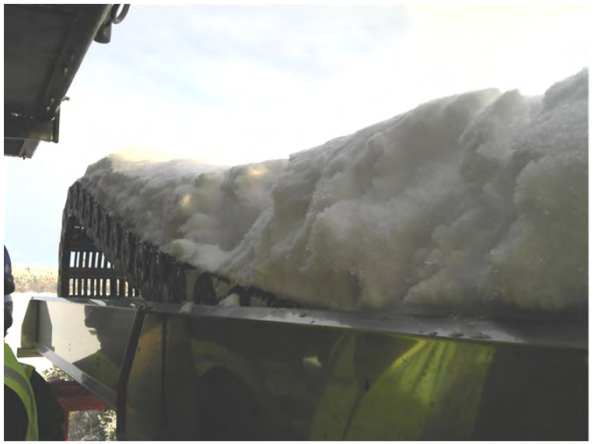
Framecontract for RTGs with

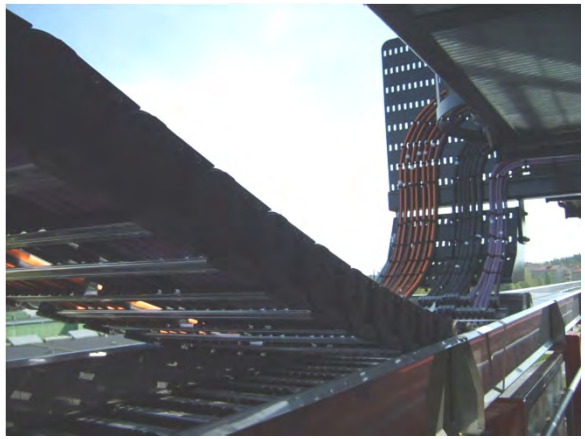
CARGOTEC
HIAB · KALMAR · MACGREGOR

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





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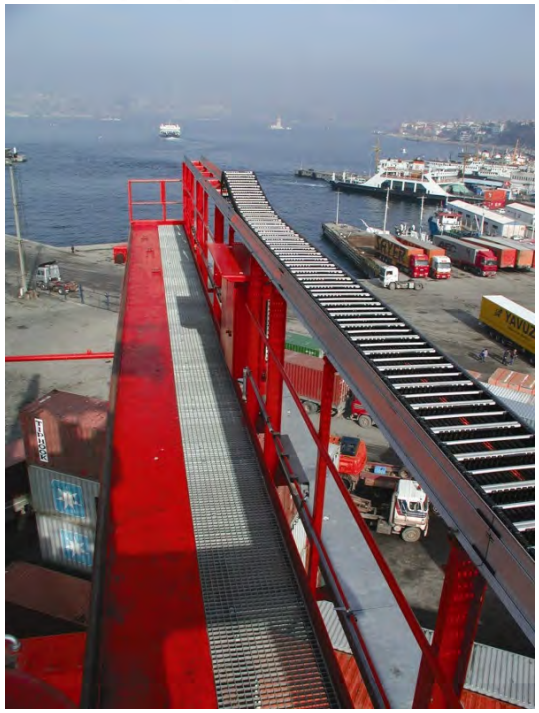
RTGs for NICOLL SPECIAL CRANES

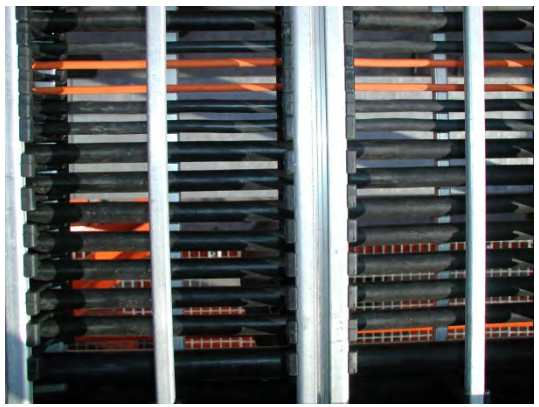
Container Terminal Istanbul , Turkey



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



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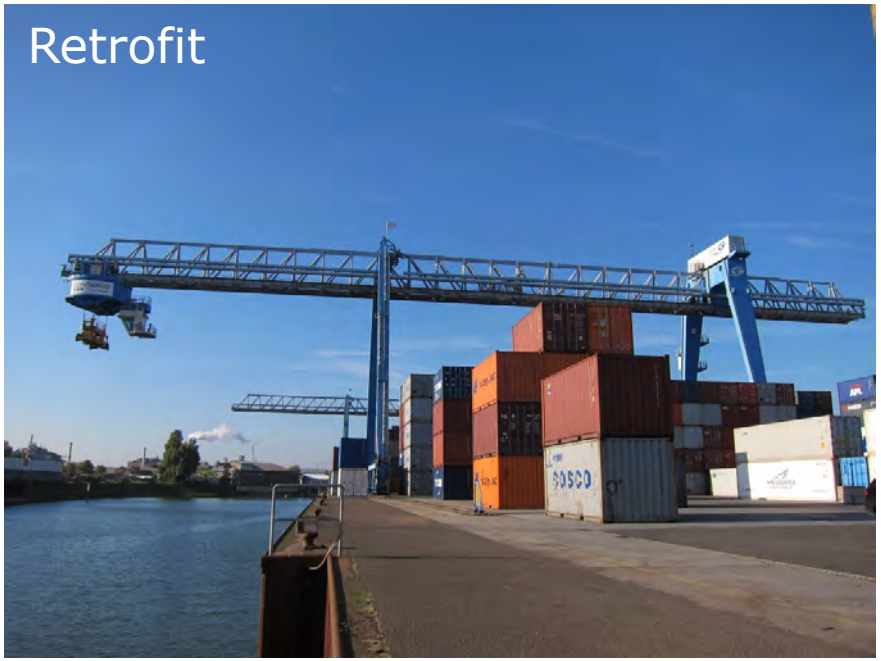
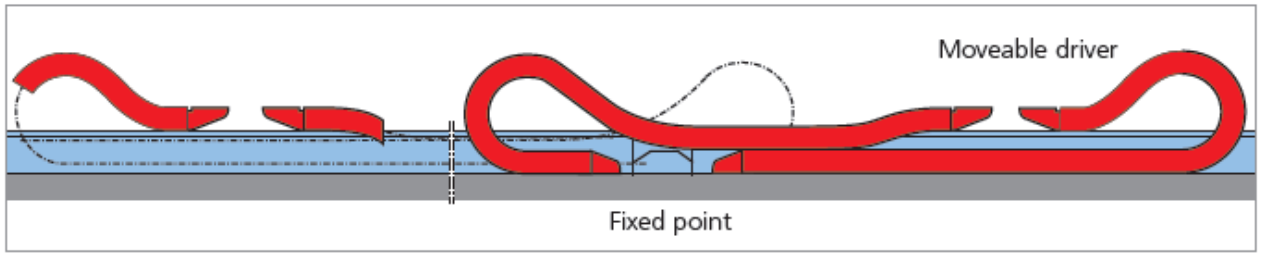
CONTARGO®

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/s²
Additional load	17 kg/m
Installation:	
Cable carrier:	MC1300.335-RMF-360-57200





Opposing arrangement

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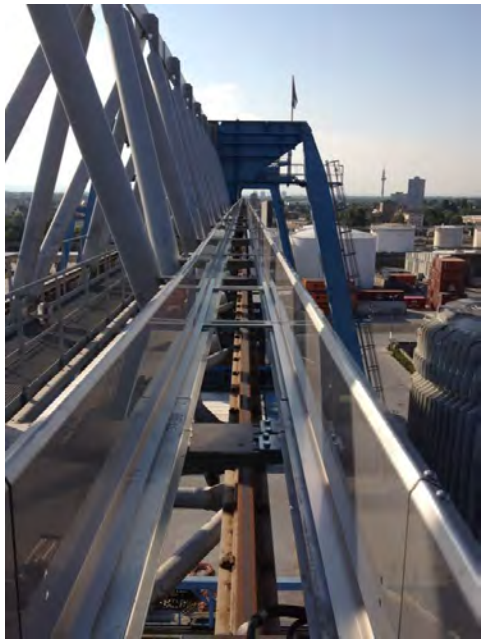

CONTARGO®
trimodal network

Retrofit on a Gottwald STS-crane

Innovation in Motion TSUBAKI

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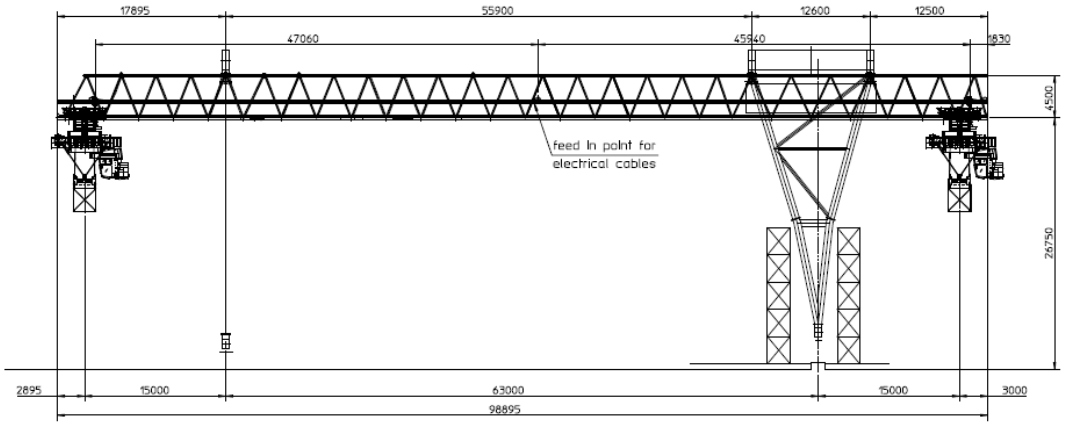
TSUBAKI KABELSCHLEPP

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/s²
Additional load	12,2 kg/m
Cable carrier:	MC1250.300-RM-260-50500



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Liebherr Container Cranes Ltd.

turnkey Totaltrax-Systems for two RMG‘s

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RMG for kirchhoff

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/s²
Opposite Arrangement	
Additional load	12 kg/m
(divided among two carriers)	
Installation:	2001-2005

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Retrofit Container Terminal Altenwerder (CTA), Germany

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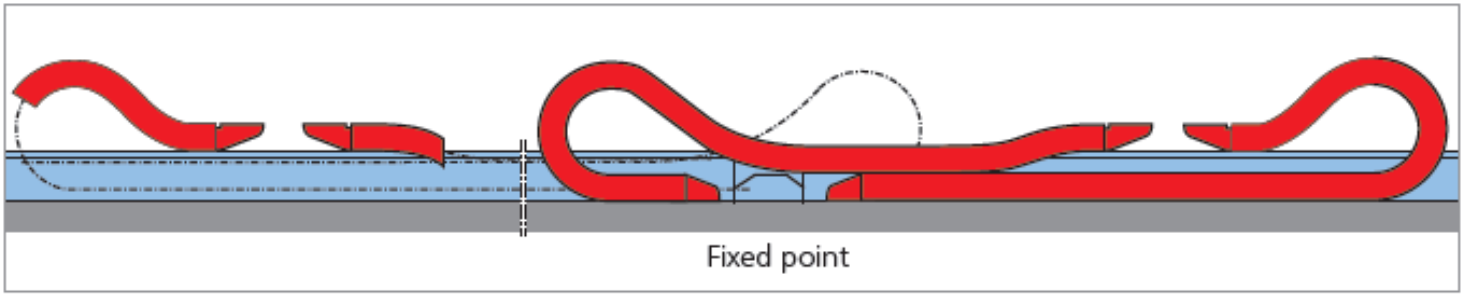
stx Goliath Cranes

- 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

Innovation in Motion TSUBAKI

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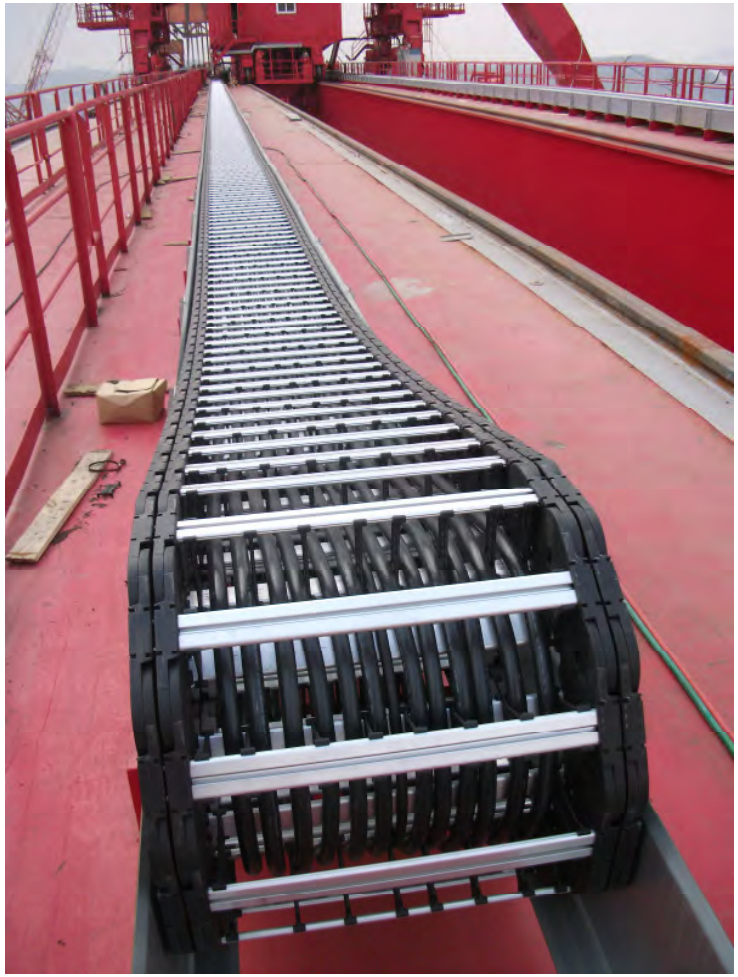
stx **Goliath Cranes**

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



Innovation in Motion TSUBAKI

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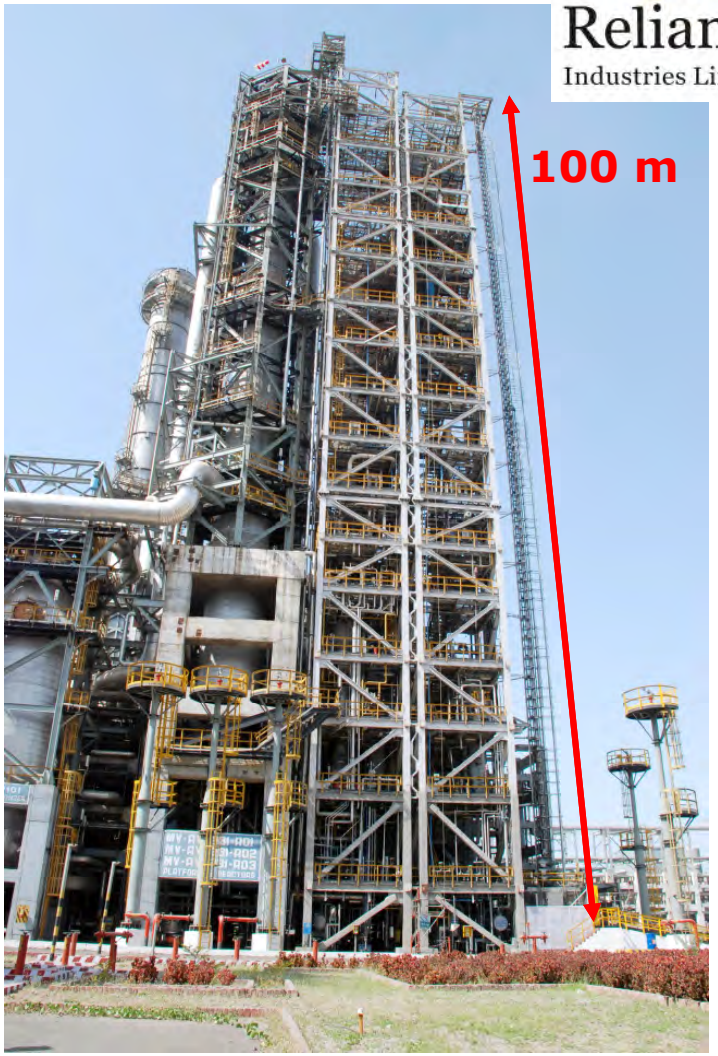
- Cable carrier system for elevator.
- Close project management between Kabelschlepp India and Germany.

Reliance
Industries Limited



Innovation in Motion

TSUBAKI

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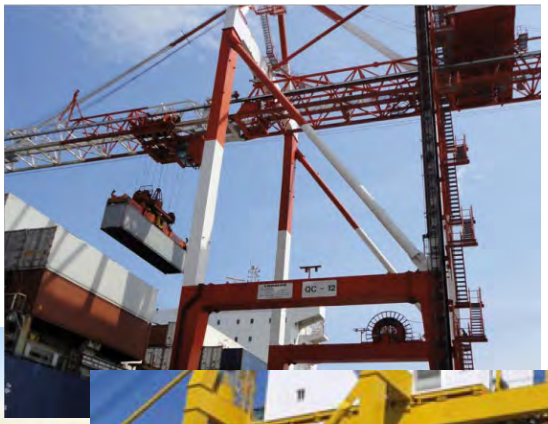
And many more.....



Innovation in Motion TSUBAKI

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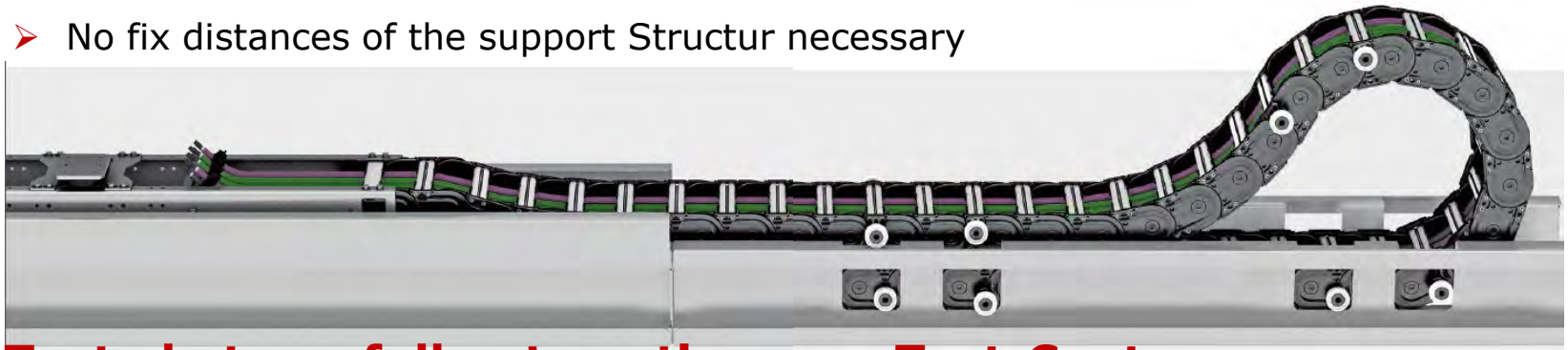
TSUBAKI KABELSCHLEPP

New development: RSC-System
(**R**oller **S**upported **C**hain)

- 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

Innovation in Motion TSUBAKI

KABELSCHLEPP TSUBAKI KABELSCHLEPP

New development: RSC-System

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

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

Innovation in Motion TSUBAKI

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New development: RSC-System

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

Proven under real conditions on outside crane test facility

KABELSCHLEPP

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Thank you
for your attention!