
igus®
INCREASE RELIABILITY
Higher equipment availability
ENHANCE SAFETY
Reduce fire risk and manual greasing
PROTECT THE ENVIRONMENT
No grease leakage, no contamination
LOWER TCO
Less maintenance, less downtime, lower cost
BULK TERMINALS A CORUÑA 2026
THE ONLY EVENT AIMED AT THE ENTIRE BULK TERMINALS INDUSTRY
21-22 OCTOBER 2026
Organised by
abto
ASSOCIATION OF BULK TERMINAL OPERATORS

Bulk Terminal Challenges

- Increase reliability
- Reduce maintenance interventions
- Increase service life
- Corrosive environments
- High loads and shock loads





Why Eliminate Greasing?

- Maintenance free
- No maintenance shutdowns
- Longer service life
- Dry running
- Low friction
- Potential fire risks from failed bearings
- Cheaper

Application scenarios:

metal bushing system



Benefits:

- Lube/grease protects from dirt, corrosion and wear

Requirements:

- Effort for lubrication tasks
- Complete lubrication system (holes, grooves, grease gun, central/automated lubrication optional and expensive)
- Maintenance schedule and training for staff

iglidur® bushing system



Benefits:

- Failsafe in case of improper lubrication
- Lower requirements on shaft quality
- Lower cost
- Lube/grease protects from dirt, corrosion and wear

Requirements:

- Effort for lubrication tasks
- Complete lubrication system (holes, grooves, grease gun, central/automated lubrication optional and expensive)
- Maintenance schedule and training for staff

iglidur® bushing system



Benefits:

- No maintenance after assembly
- Protected from corrosion by initial grease
- No risk of improper lubrication
- Lower requirements on shaft quality
- Lower cost
- Less environmental pollution

Requirements:

- Effort for „one-off“ lubrication
- A seal is recommended to keep grease in the system

iglidur® bushing system



Benefits:

- Quick assembly and no additional maintenance required
- No costs for grease or labor
- No additional machining required (holes, grooves)
- Lower requirements on shaft quality
- Lower cost
- No environmental polution

Requirements:

- Corrosion resistant shaft and housing
- Optional in case of dirt contamination: (felt) seals

250

Billion USD

productivity losses, labor and lubrication every year for machines of all kinds



Bulk Terminal Challenges

35,9

million tonnes

of lubricants are consumed every year

(statista, demand of lubricants worldwide 2000 to 2022)



plain bearings

iglidur® & igutex®

- Autolubricated
- Long service life
- Resistant to high loads
- From stock or customized
- Reduce maintenance



Metal
stronger
than
plastic?

Old news.



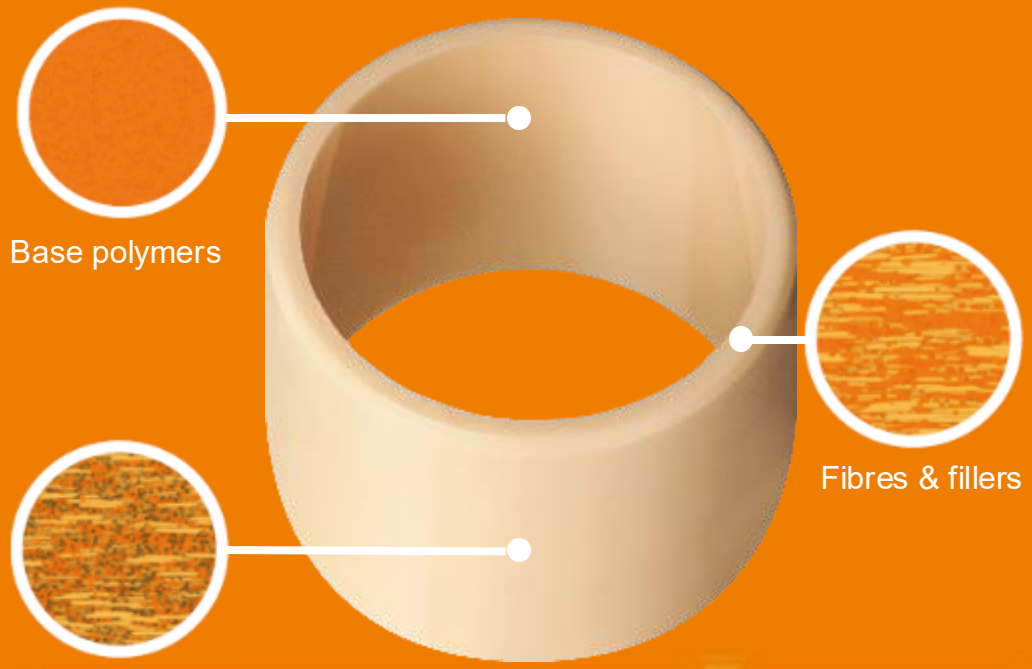
Can igus replace metal for plastic bearings?



- *can igus replace metal for plastic bearings?*
- *no maintenance – no lubrication – can it work?*

igus Motion Plastics Technology

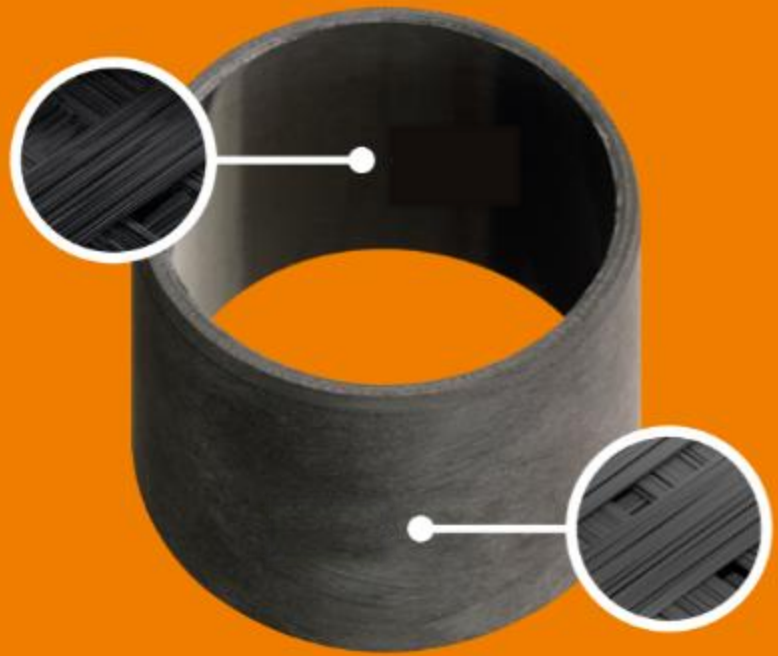
iglidur®

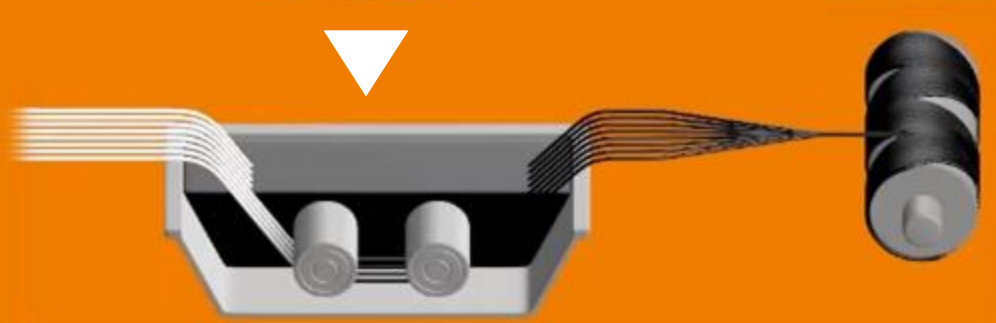




Injection molding

igutex®





Fiber-winding

igus® laboratory & testing facility

5500m², 16.000 tests annually, 450 test benches, 135 trillion test movements!





Large variety of test benches

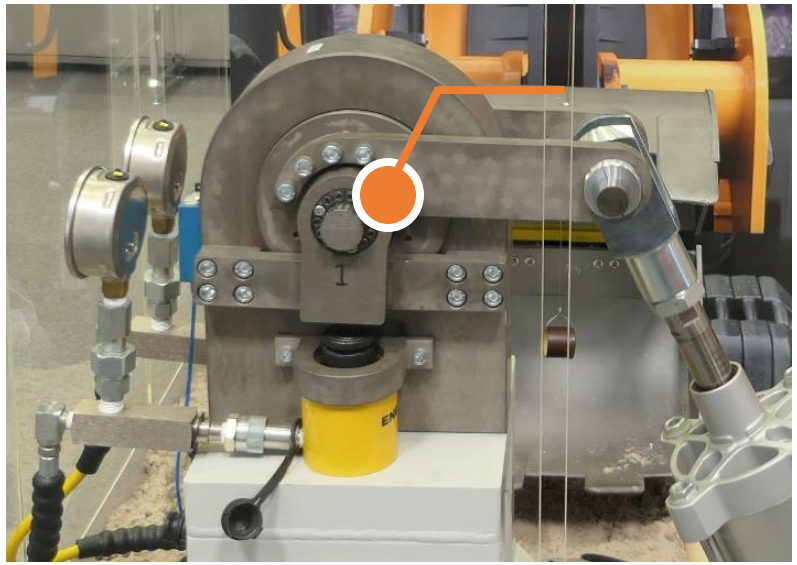


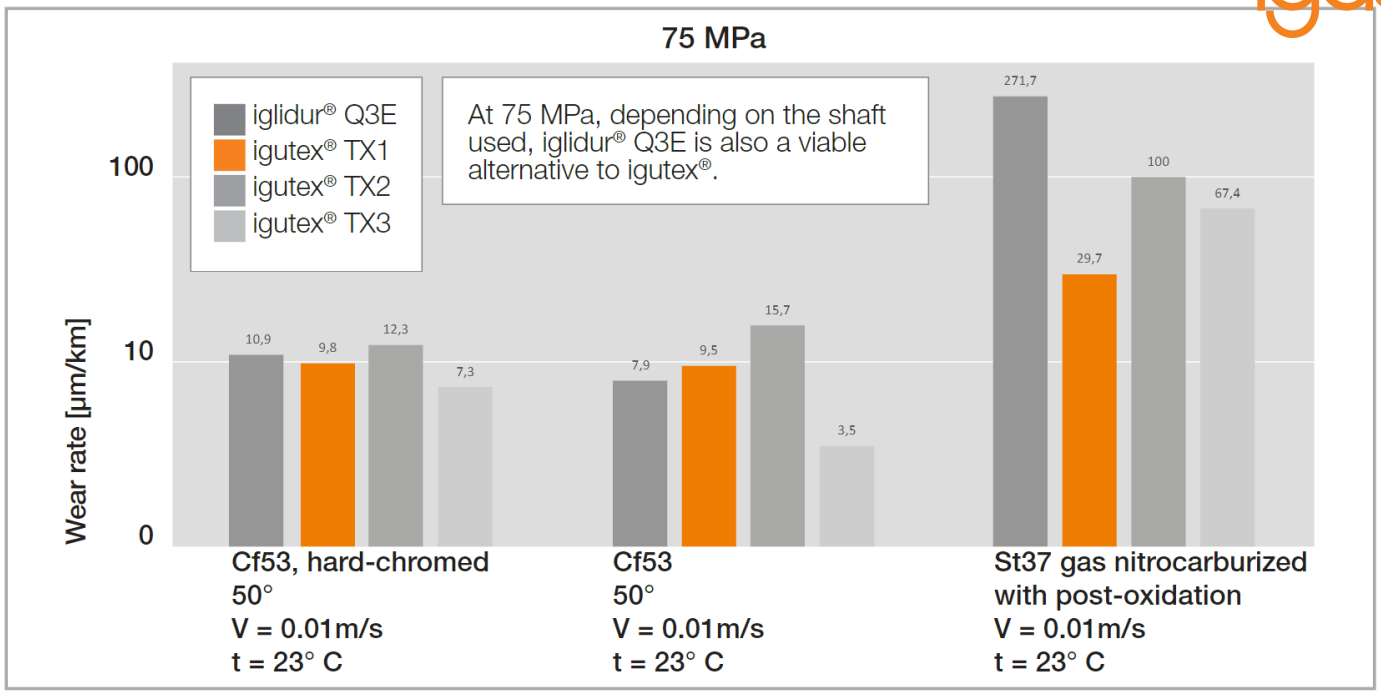
Underwater testing

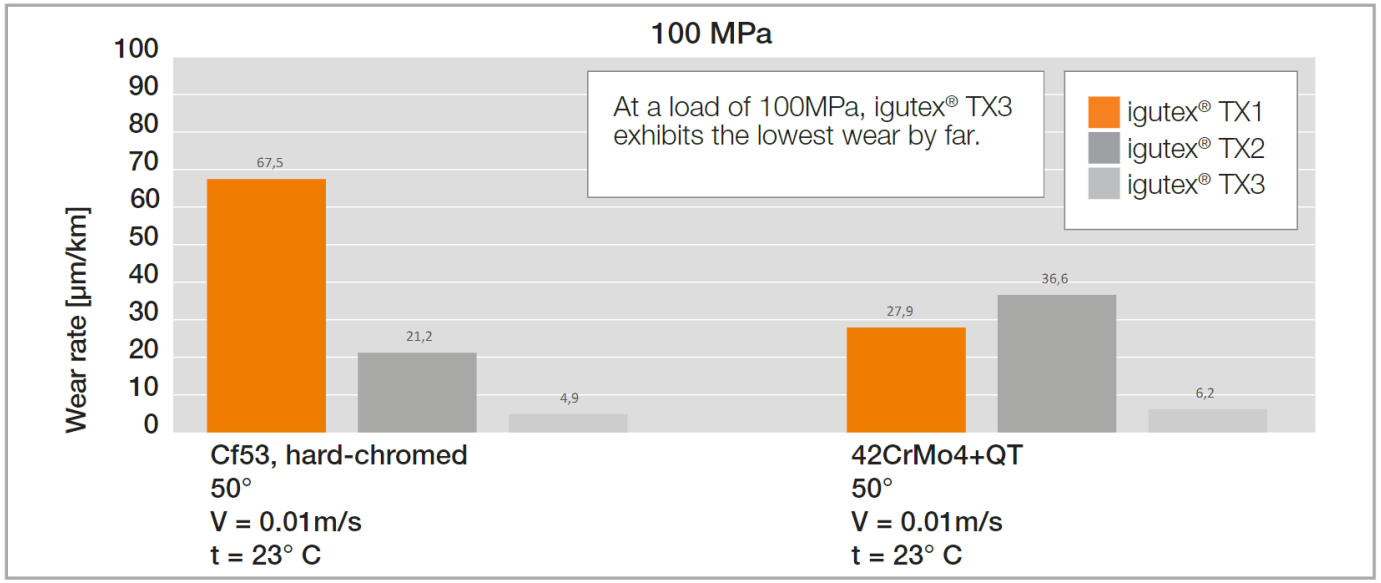


Heavy duty bearing test bench

High load performance







Metal stronger than plastic?

Old news.

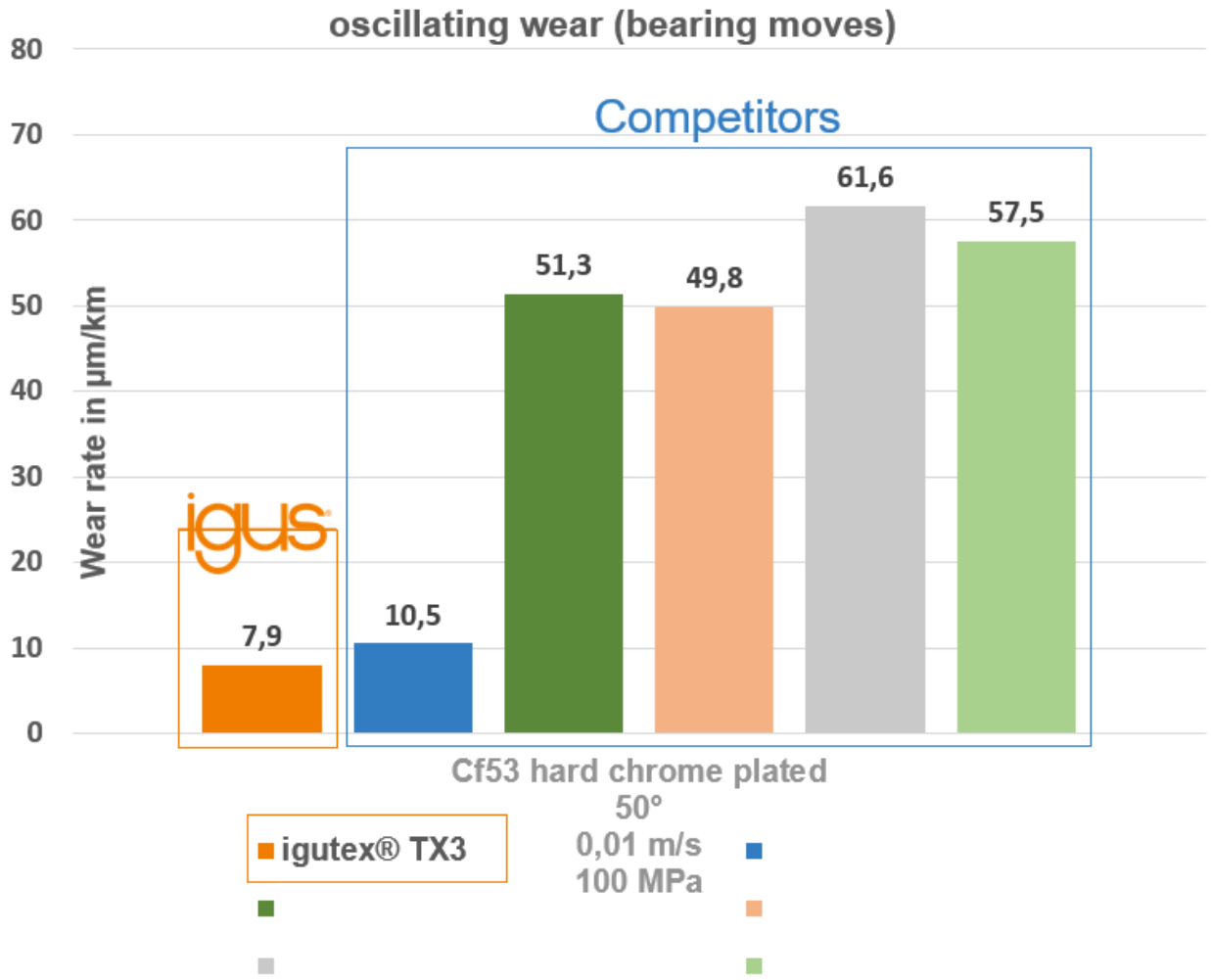
Test parameters:

Force/load:	80MPa (12.8t on a plain bearing with Ø40mm, length 40mm)
Speed:	0.01m/s (30 cycles 50°/min.)
Shaft:	42CrMo4+QT, gas-nitrocarburised with post-oxidation
Cycles:	50,000 = 1.75km running performance



igutex® vs. competition

Results from the igus laboratory igus®





Metallic bearings & no lubrication?

This test result clearly indicates what happens when metallic bearings e.g. bronze improperly maintained.

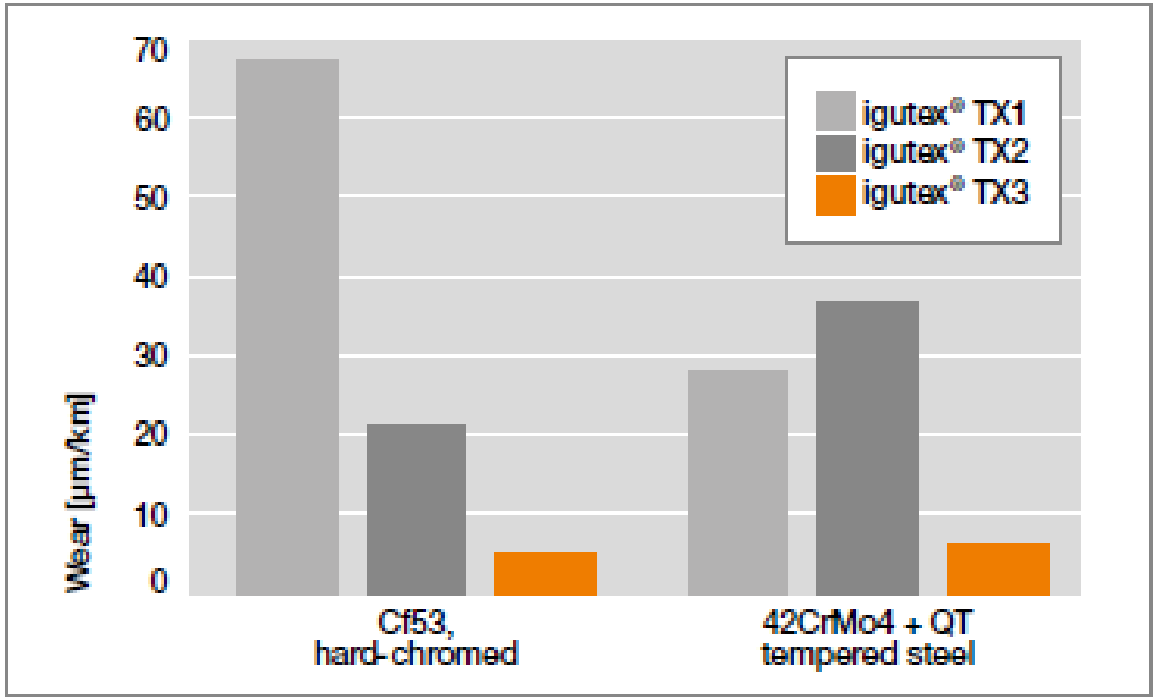
Severe damage to not just the bearing, but the shaft as well.



igutex® fiber-wound

igus® heavy-duty materials

- Lubrication- & maintenance-free
- Tested under real-world conditions



Wear rate against different shaft materials, p = 100MPa; v = 0.01m/s



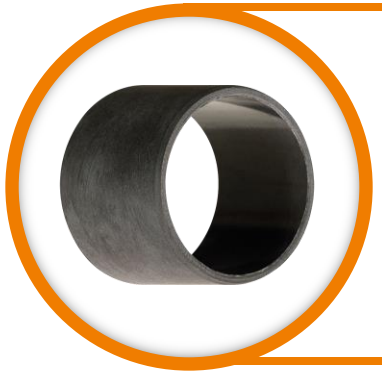
igutex® TX1

- The robust Allrounder
- Max. 200MPa static
- Max. 140MPa dynamic
- Most diameters available



igutex® TX2

- Made for hard chromed shafts
- Up to 3,5 times longer service life than TX1 on h.c. shafts

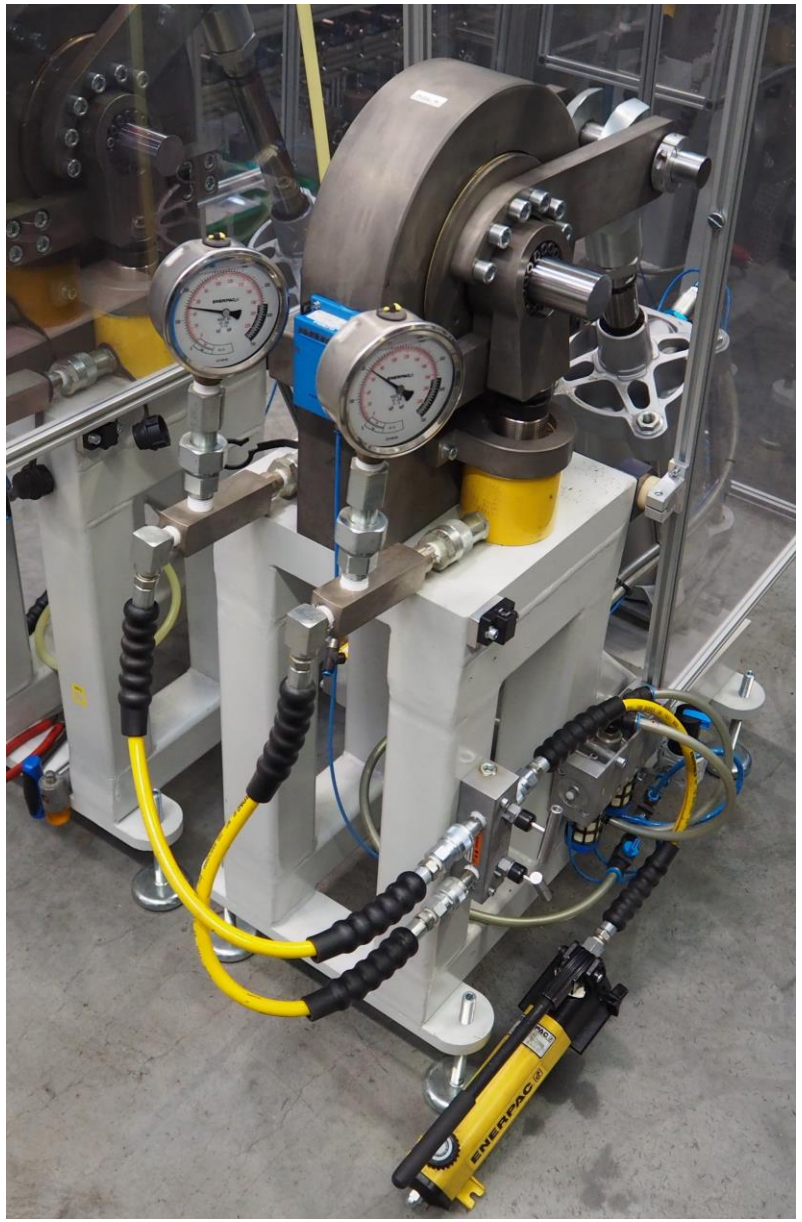


igutex® TX3

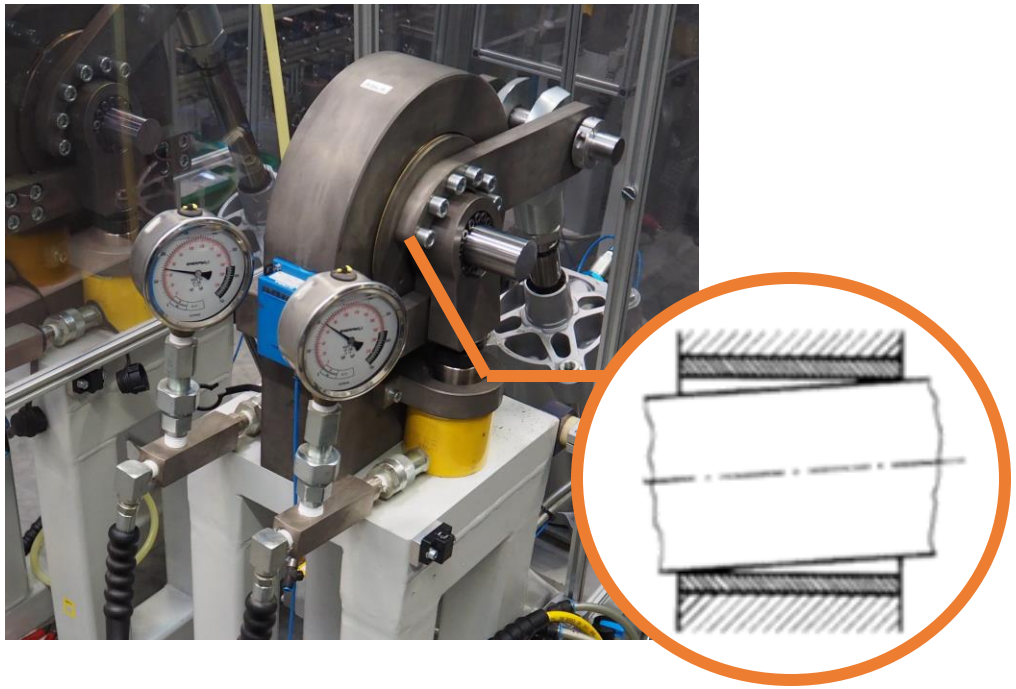
- Endurance at highest loads
- Max. 180 MPa dynamic
- 0,1% max. water absorption

Testing and parameters:

- Movement: tumbling oscillating
- Oscillating angle α = 50°
- Speed on gliding surface v = 0,01 m/s
- Environmental temperature t = RT
- load p = 130 MPa
- 200.000 aim cycles
- igutex® TX1, igutex® TX3, AlBC3
- Greasing: once an hour (AlBC3), initial greased and dry run (igutex® TX1 and igutex® TX3)
- Shaft: SMC440-H, Ra 1,7 µm (customershaft)



Edge load performance



- Size Ø40 mm x length 40 mm
- Movement: pivoting, angle 50°
- 23°C room temperature
- **load p_{left}: 60,8 kN, load p_{right}: 40 kN**



iglidur Q2 (standard molded)
7.526 cycles



igutex TX1 (fiber wound)
50.914 cycles



iglidur Q3E (2K molded)
30.940 cycles



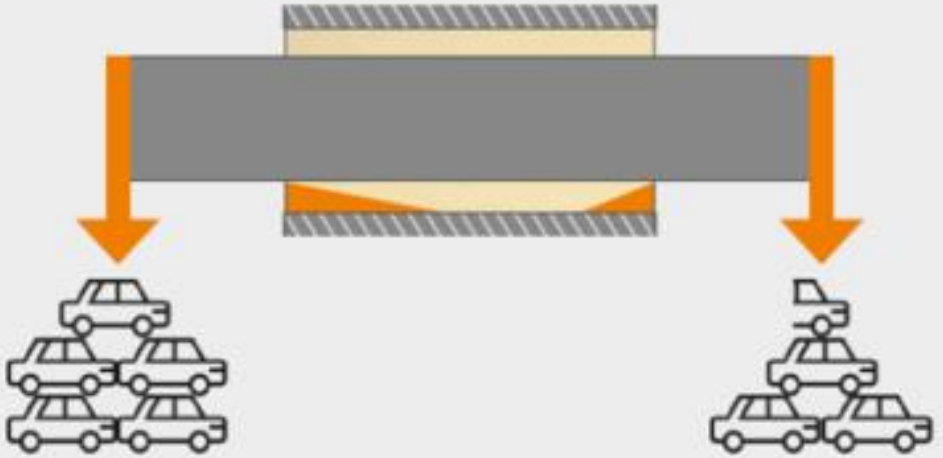
iglidur TX3 (fiber wound)
109.602 cycles

Edge load test

Test parameters:

Pivoting angle: 50°
Temperature: 23 °C
Load: p_{left}: 60,8 kN
p_{right}: 40 kN
Ø and length: 40 mm

Cycles limited to 100k



Cross-section of an edge load test

Tests we are also conducting for heavy duty applications:

- Swell loads
- Temperature
- Outdoor areas

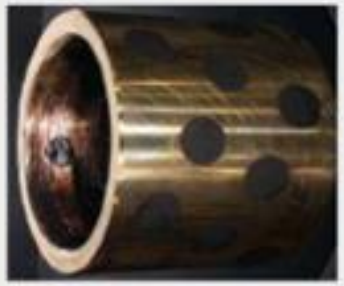
We also conduct individual tests for our customers.



Heavy-duty test rig in the igus® test lab



Brass, lubricated
37.000 Cycles



Bronze-graphite
37.000 Cycles



Fibre-wound (competitor)
65.000 Cycles



Metal-polymer
100.000 Cycles



iglidur® Q2
7.500 Cycles



iglidur® Q3E
100.000 Cycles



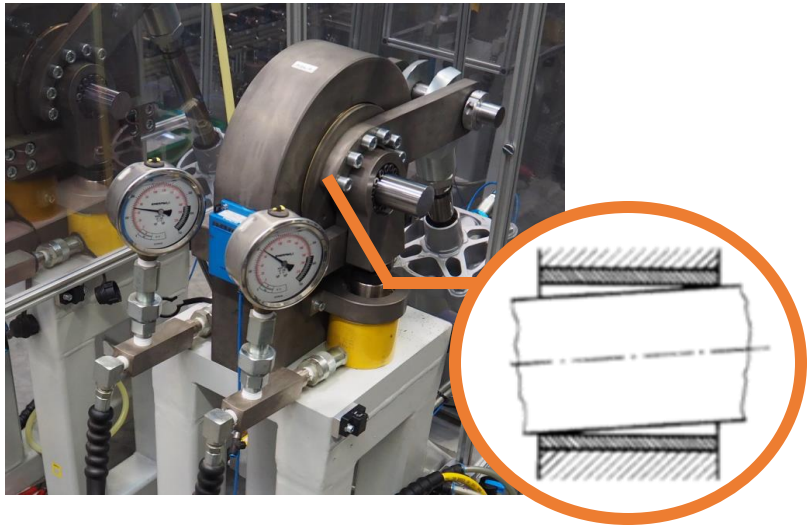
igutex® TX1
100.000 Cycles



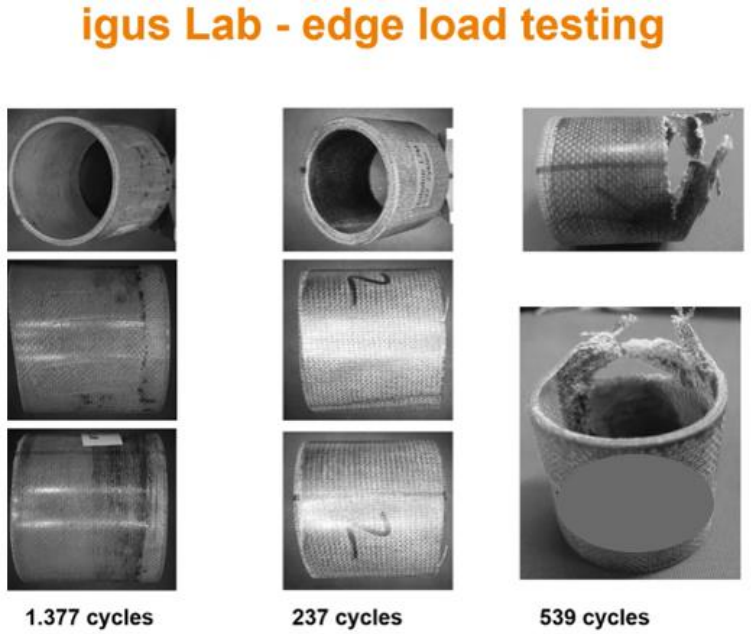
igutex® TX3
100.000 Cycles

igutex® vs. competition

Results from the igus laboratory igus®



- Size Ø40 mm x length 40 mm
- Movement: pivoting, angle 50°
- 23°C room temperature
- **load p_{left}: 60,8 kN, load p_{right}: 40 kN**

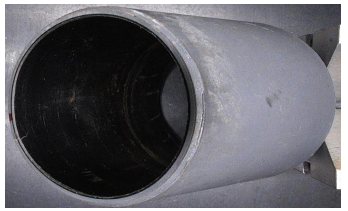




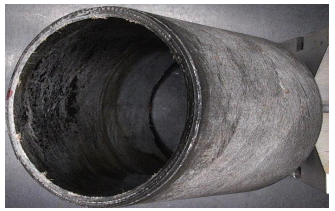
iglidur Q2 (standard molded)
7.526 cycles



igutex TX1 (fiber wound)
50.914 cycles



iglidur Q3E (2K molded)
30.940 cycles



iglidur TX3 (fiber wound)
109.602 cycles

Case study

- p = 60 MPa
- 50° oscillation
- 30 cycles / Min.
- v = 0,01m/s
- 200.000 cycles

  = 7 km running distance
- **Customer Shaft: C45**



due to all the lab test results we so far had we were confident that our new igutex TX3 is a very good option on this shaft at this load

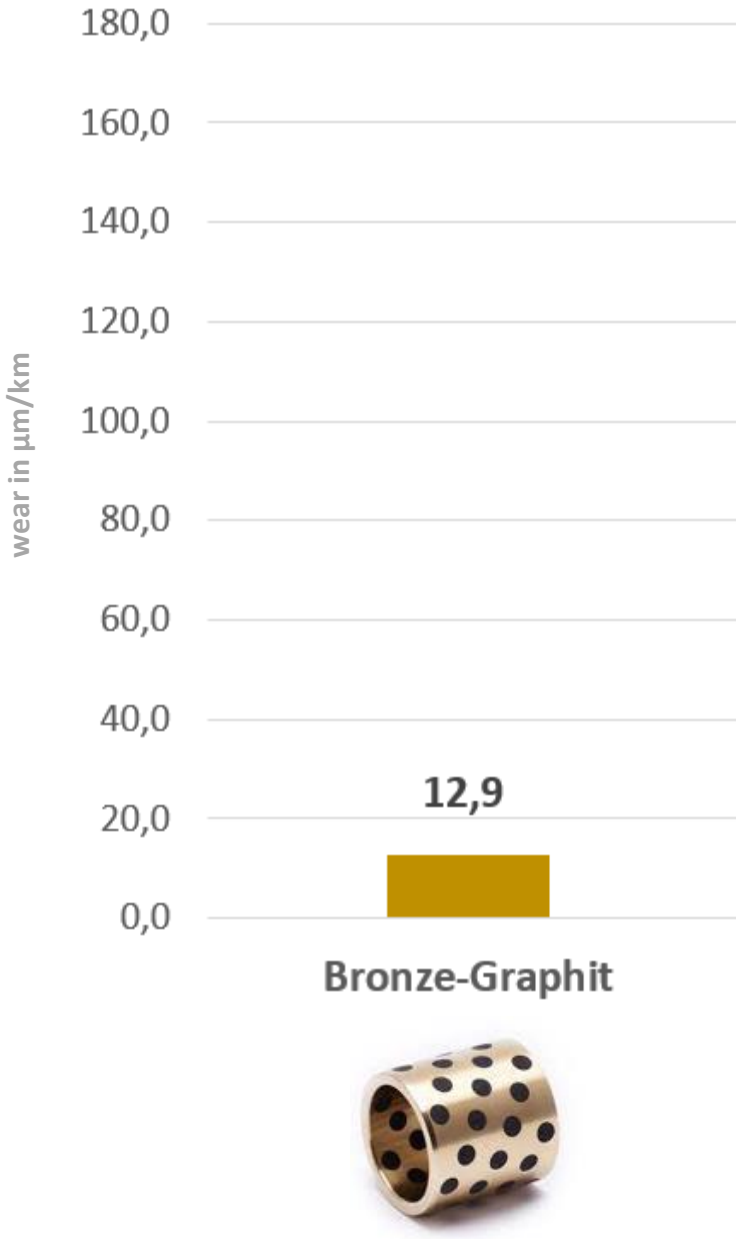




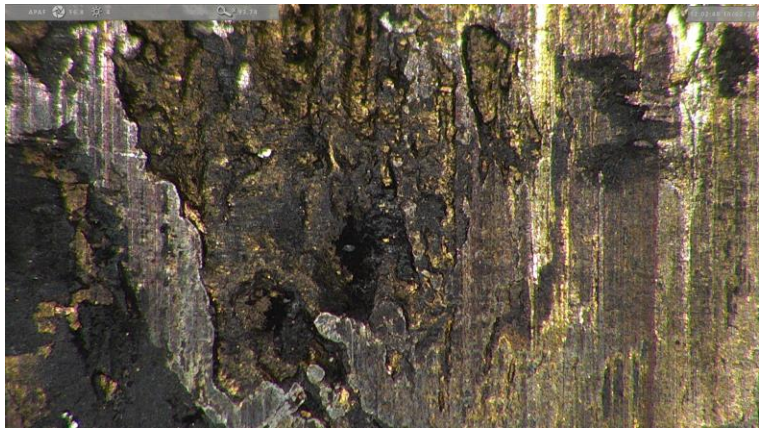


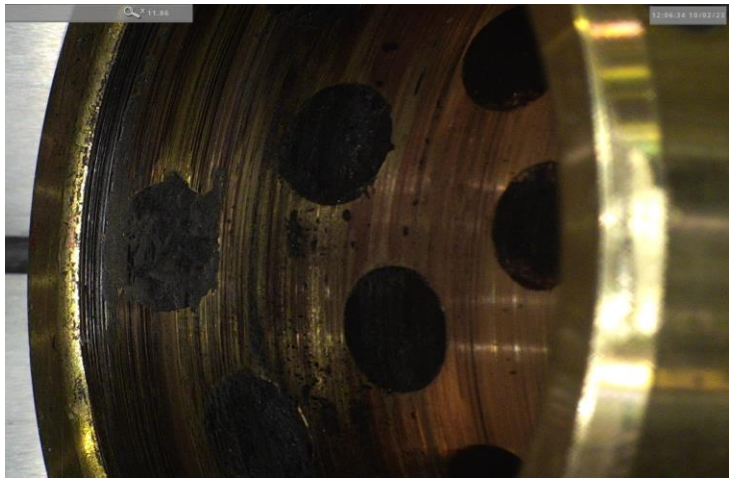


Case study

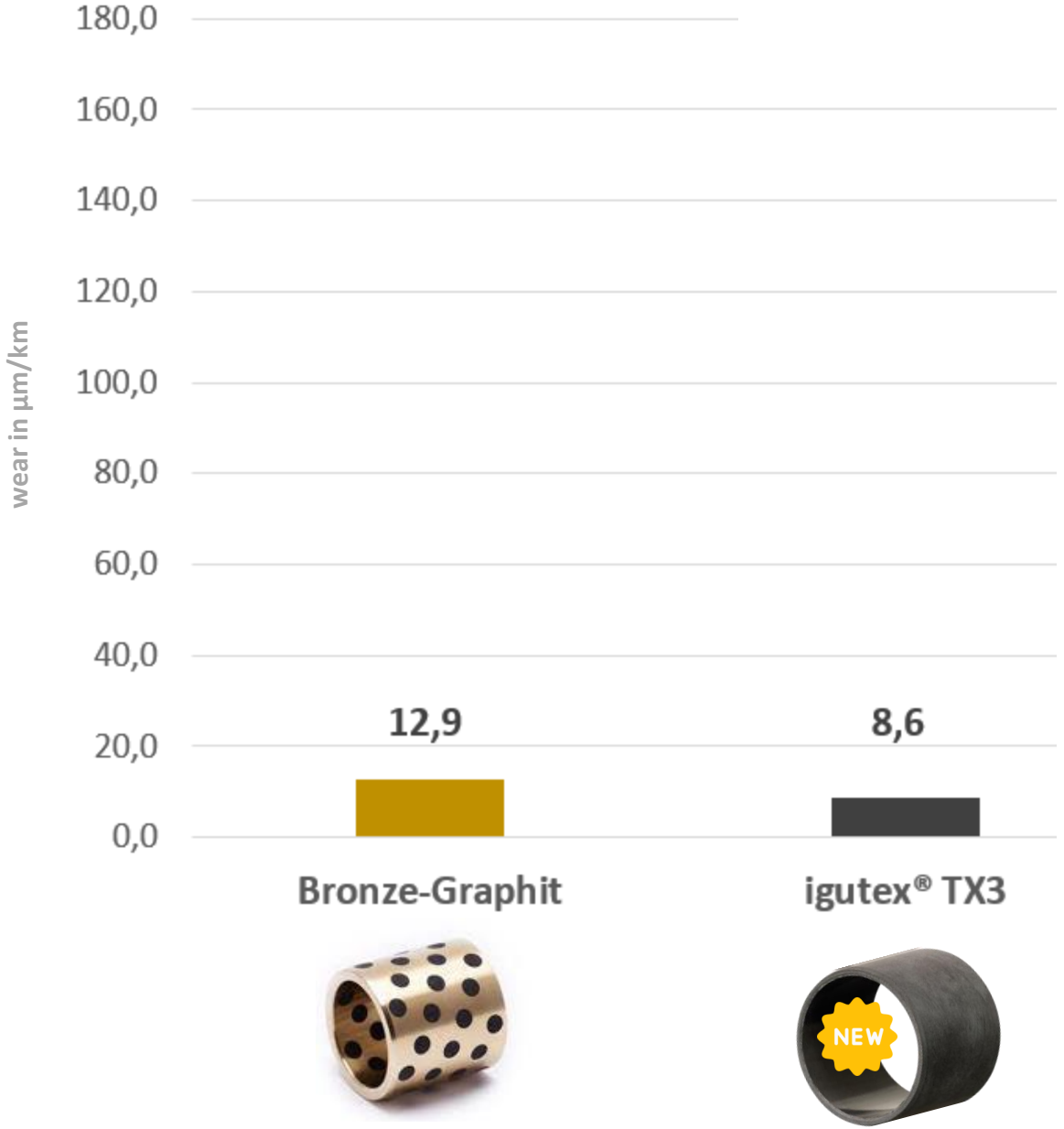

180,0
160,0
140,0
120,0
100,0
80,0
60,0
40,0
20,0
0,0
wear in µm/km
12,9
Bronze-Graphit







Case study


180,0
160,0
140,0
120,0
100,0
80,0
60,0
40,0
20,0
0,0
wear in µm/km
12,9
8,6
Bronze-Graphit
igutex® TX3
NEW


TX3 the endurance runner
for highest loads







Looks familiar?



...or do you know this?

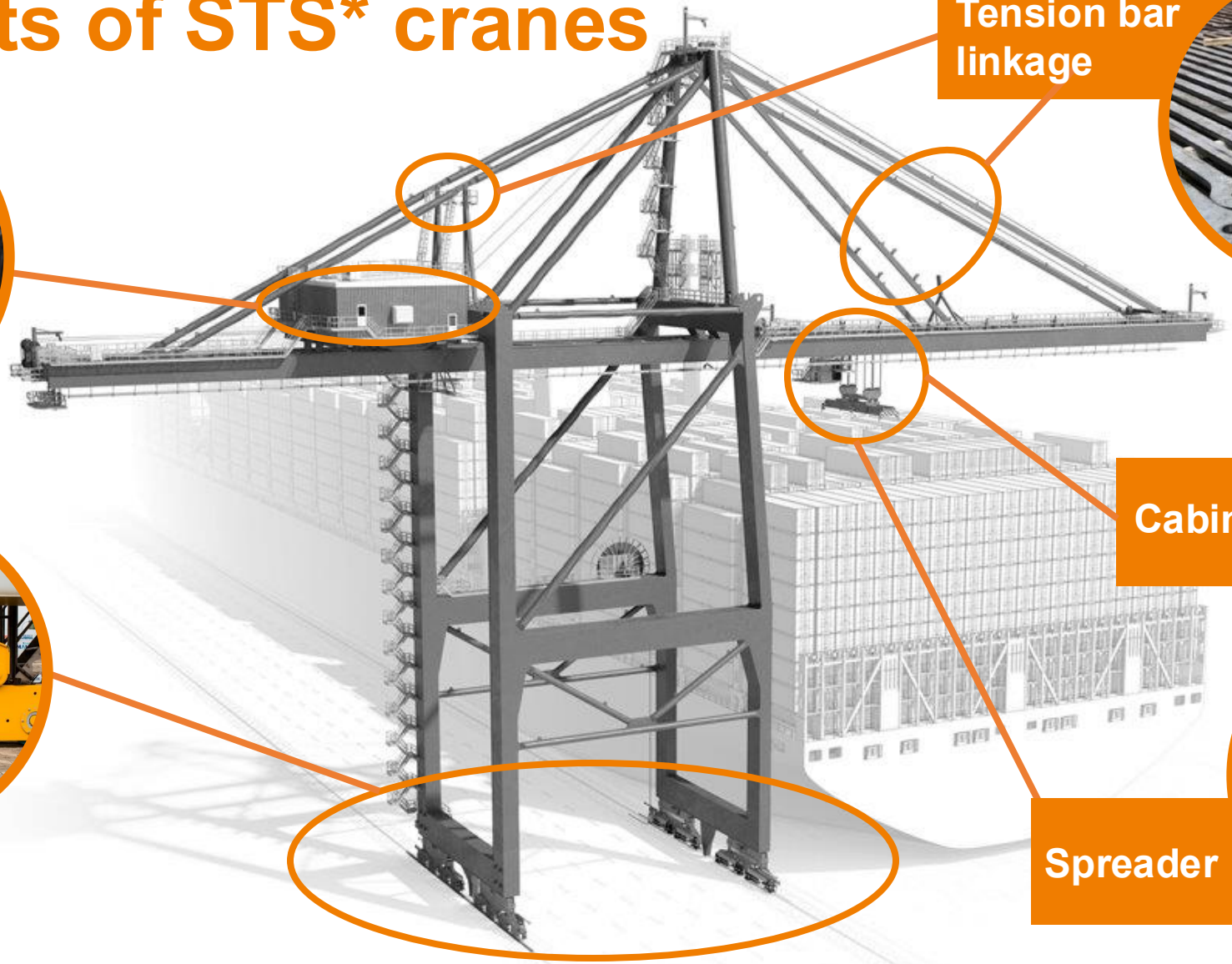


Shipbuilding & Equipment

-

Applications

Bearing points of STS* cranes



Brake



Bogie



Tension bar linkage



Cabin

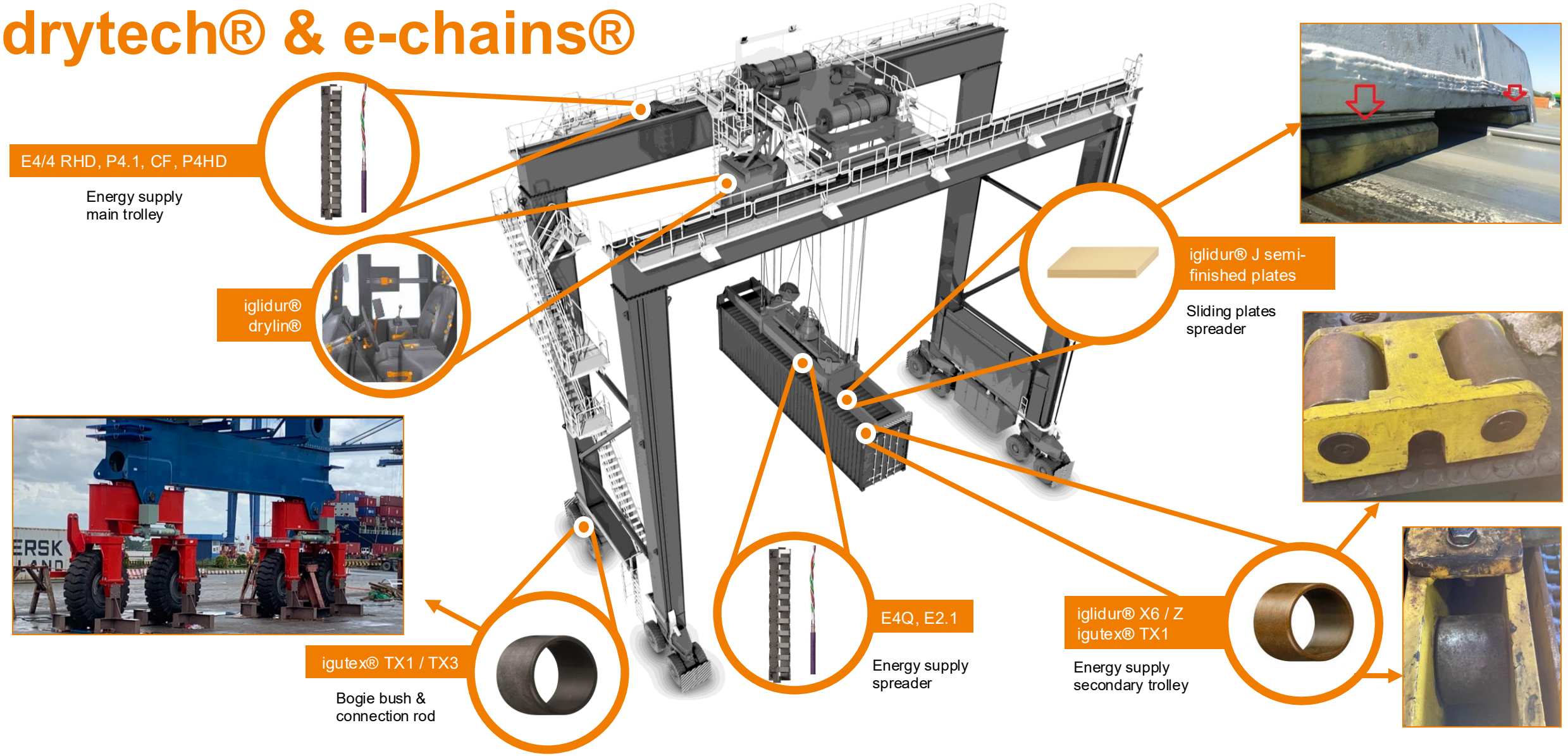


Spreader



*STS; ship to shore

drytech® & e-chains®

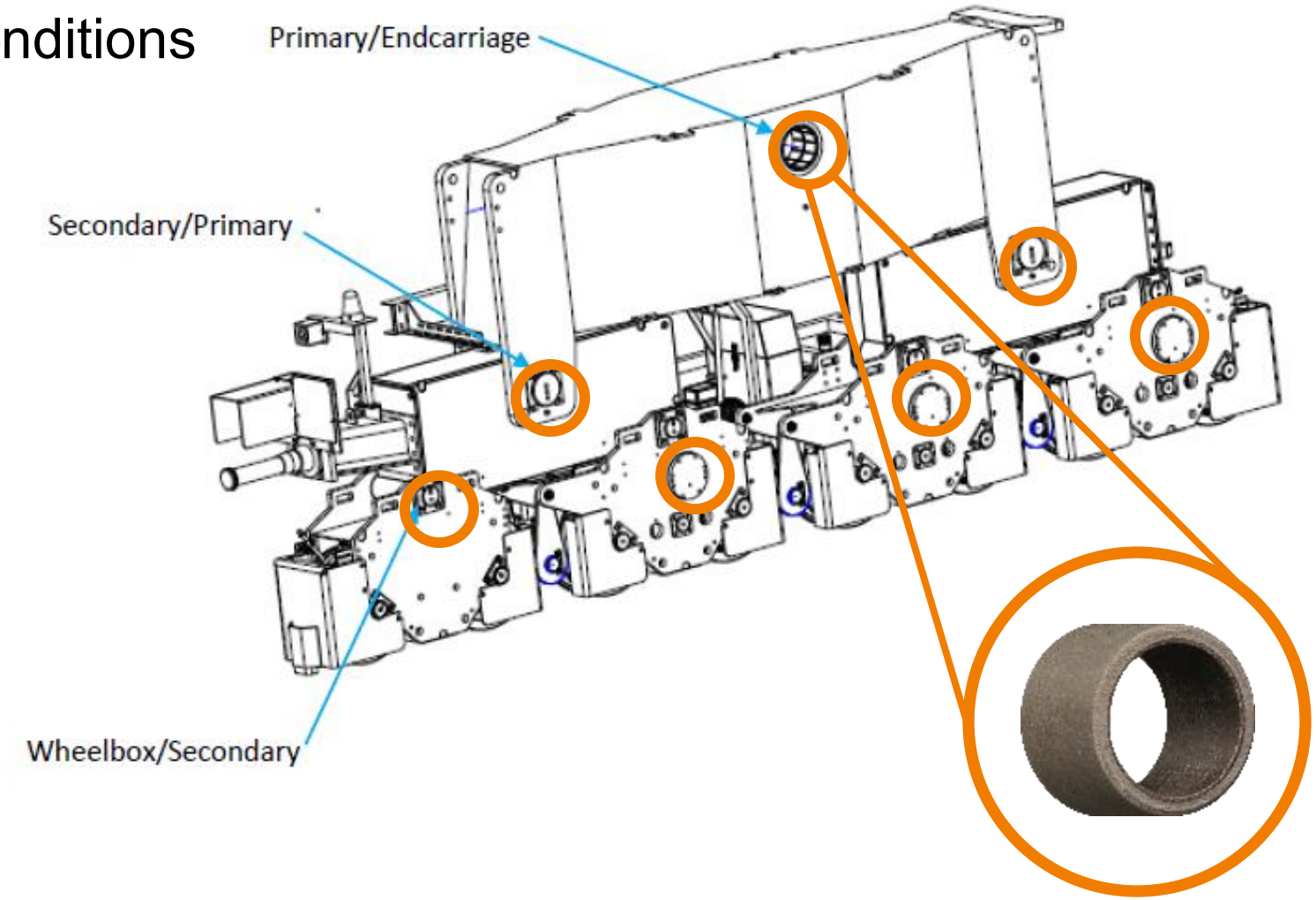


igutex® in crane bogie

Weight distribution on chassis

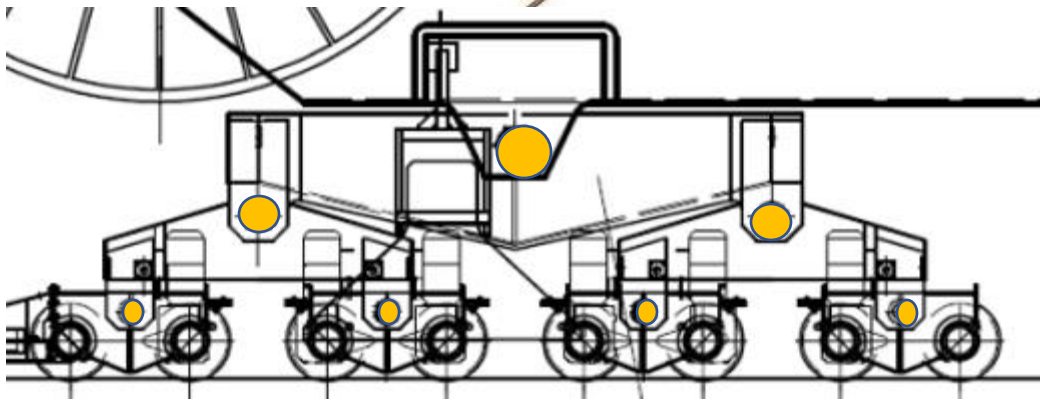
- Exposed to demanding conditions
- Inconvenient to lubricate
- Extremely heavy loads





igutex® in crane bogie





Pos.	Art. Nr.
1.000	TX3SM-S-180200-130 igutex® TX3 Gleitlager
2.000	TX3SM-S-150165-120 igutex® TX3 Gleitlager
3.000	TX3SM-S-120135-90 igutex® TX3 Gleitlager

igutex® in crane bogie





"retrofit"

igutex® in wood chip unloader

igutex in multi-flap grab bucket

- 18 x bearings per grab bucket
- TX1SM-7585-150
- Former solution: Metal bearings
- Problems: Not enough greasing -> bearings seize (long travel – less cycles)





igutex® TX1 in crane excavator shovels

Bearings for bucket hinges

- No lubrication required
- No maintenance needed
- Corrosion-free
- Weather-resistant
- Suitable for high loads





Customer successes in South Korea

igutex® TX1 in ship crane

Multiple applications

- no problems with corrosion
- heavy duty application
- TX1 for pivoting points







-Sharing allowed-

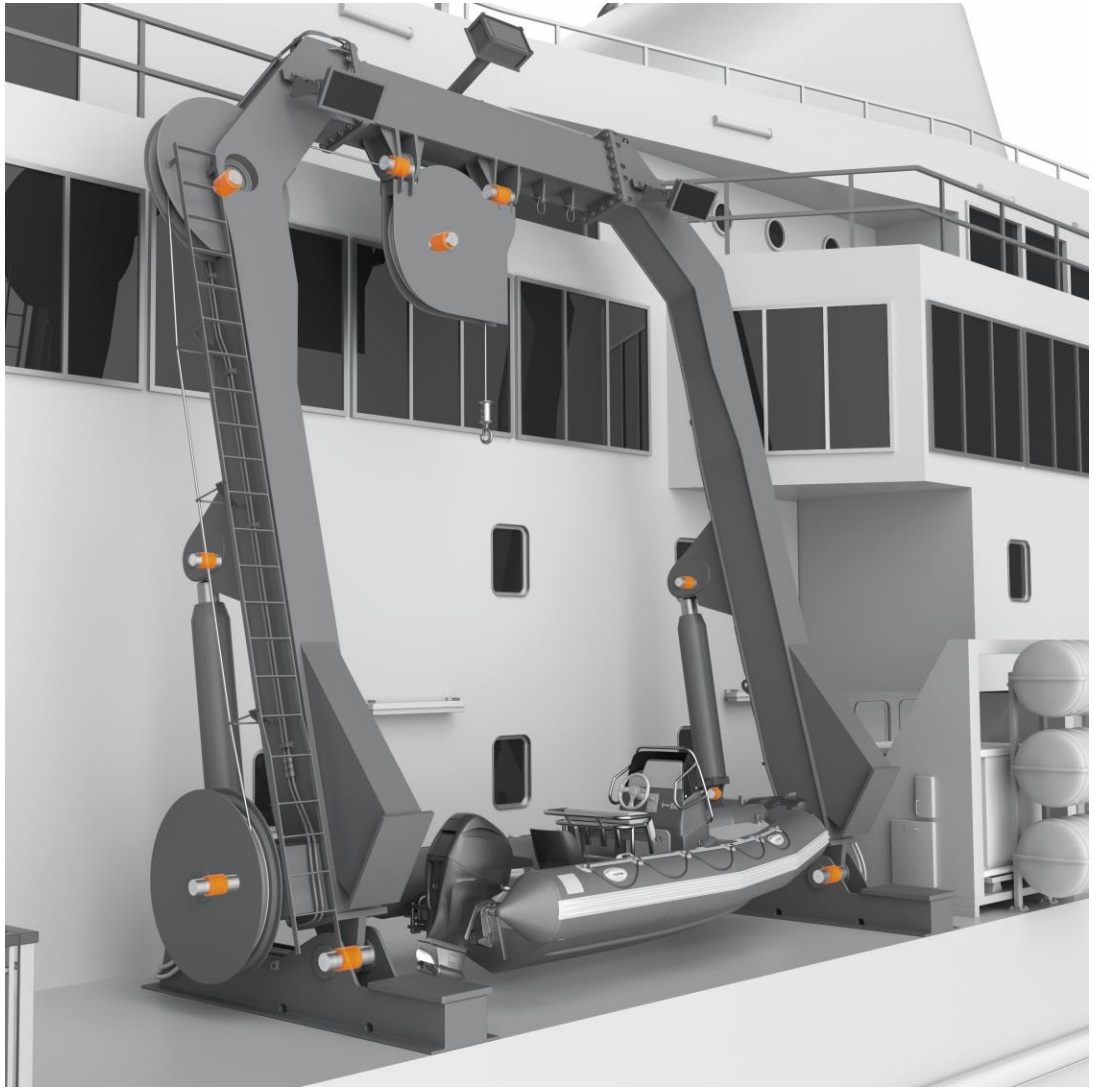
igutex® TX1 in A-Frames

Multiple applications

- no problems with corrosion
- heavy duty application
- TX1 for pivoting points







-Sharing allowed-

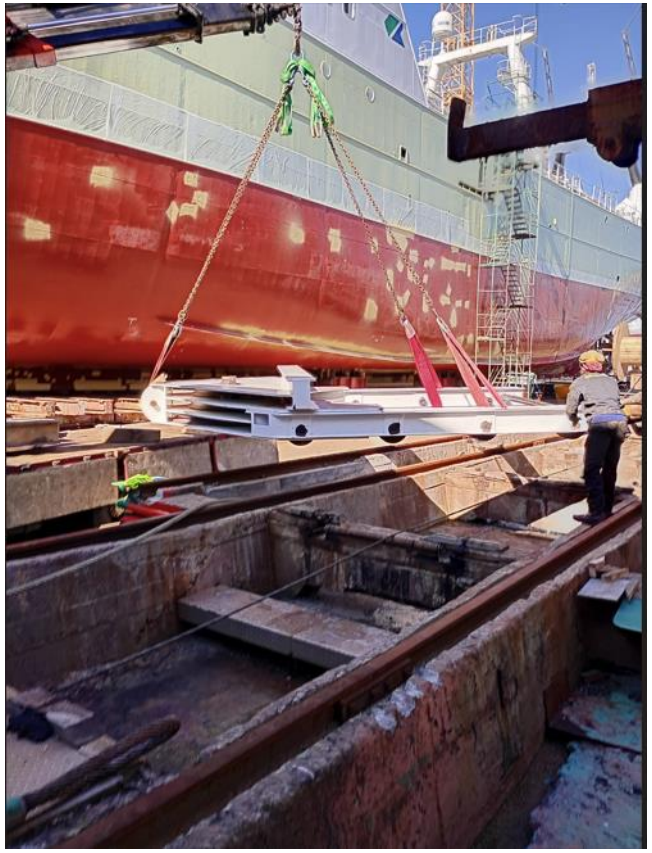
igutex® in wrecked car in scrapyards

igutex TXH-100140 tube + igutex TX1 bearings

- Reduce maintenance &extend application lifetime
- Autolubricate
- No corrosion







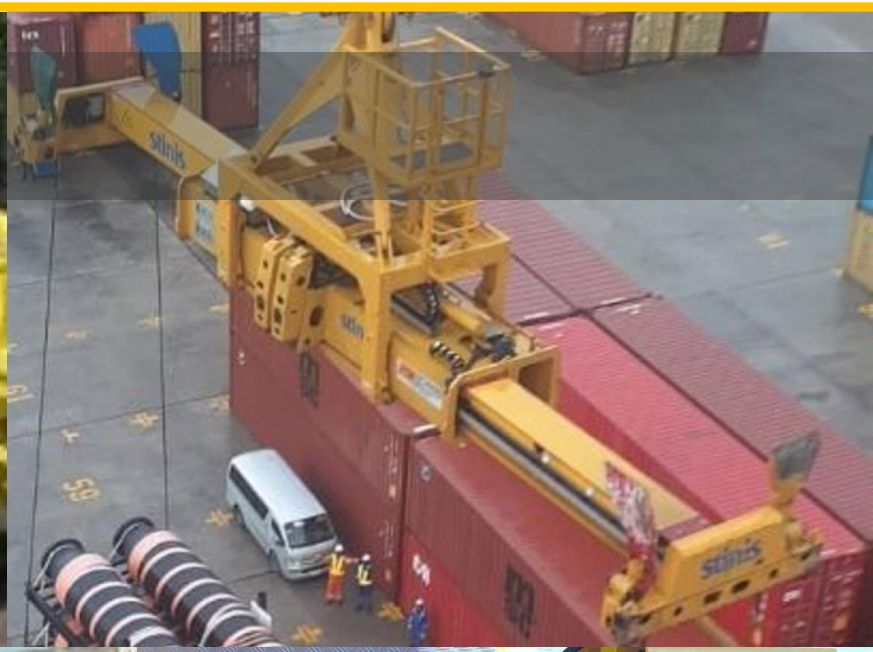




… Spreader applicatios …













iglidur® & igutex® for spreaders

- **igutex® TX3**
- Netherlands

- TX3 bearings to replace PWM bearings

- No Lubrication
- High Load
- Wear Resistance



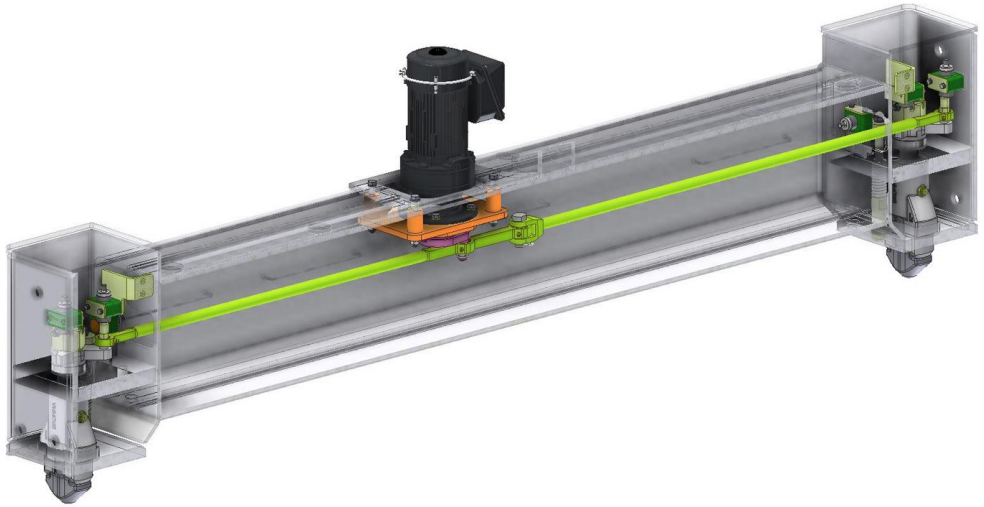


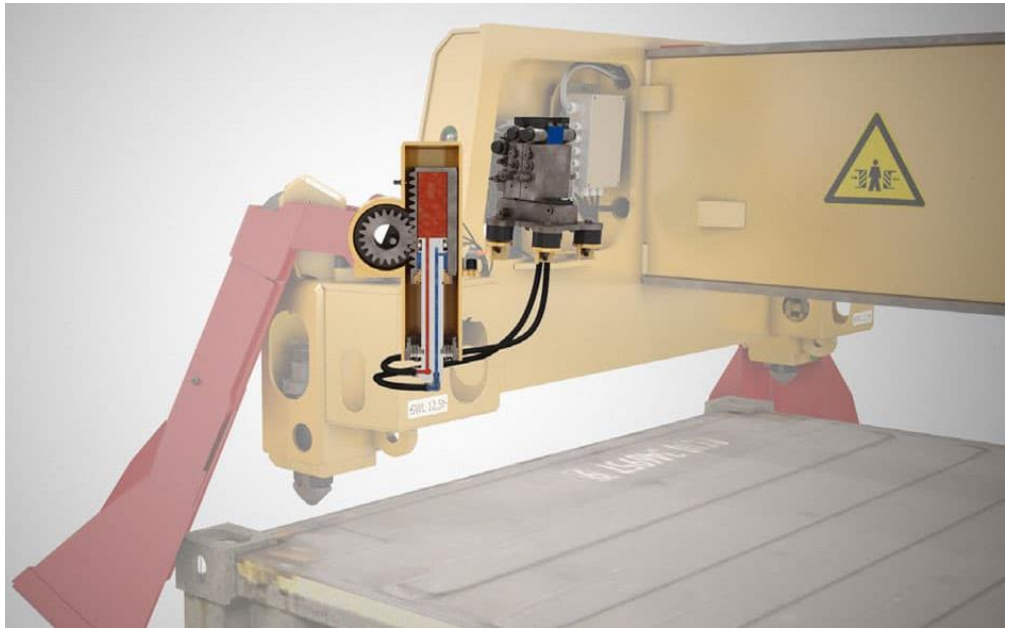


iglidur® & igutex® for spreaders

- Twist lock area ZFM-2023-16
- Bracket area X6SM-2023-15 & ZTM-2036-015



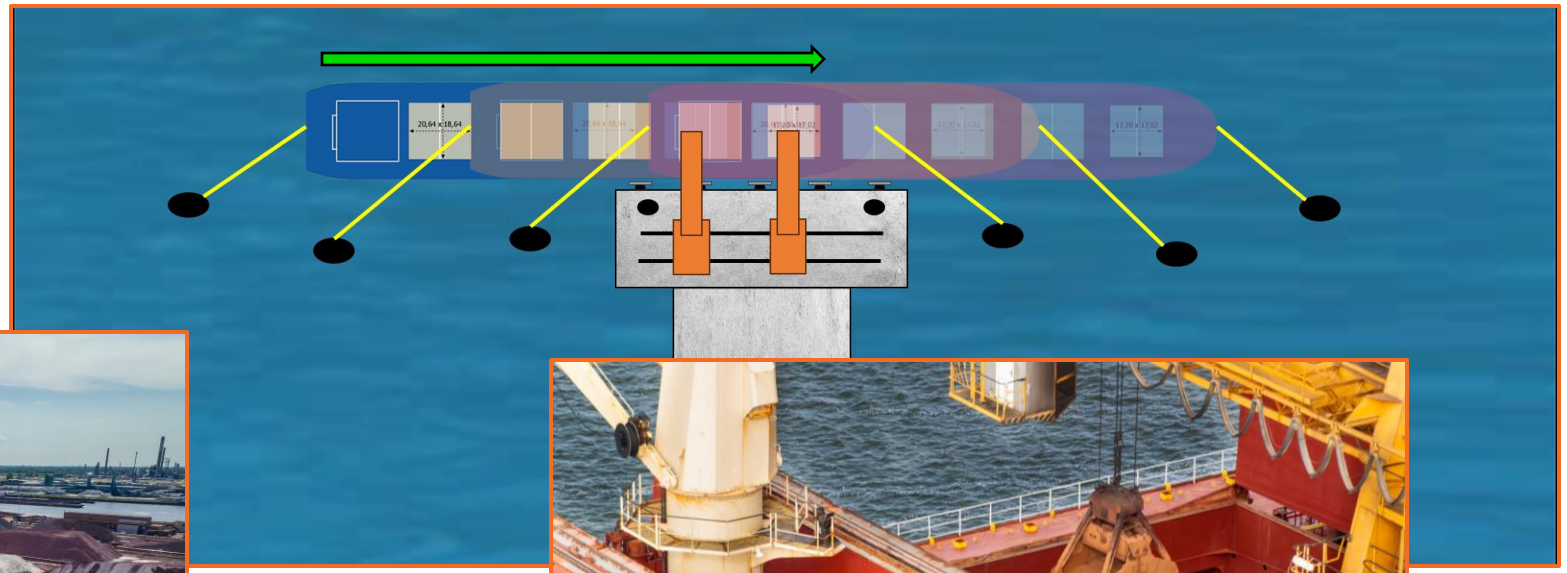


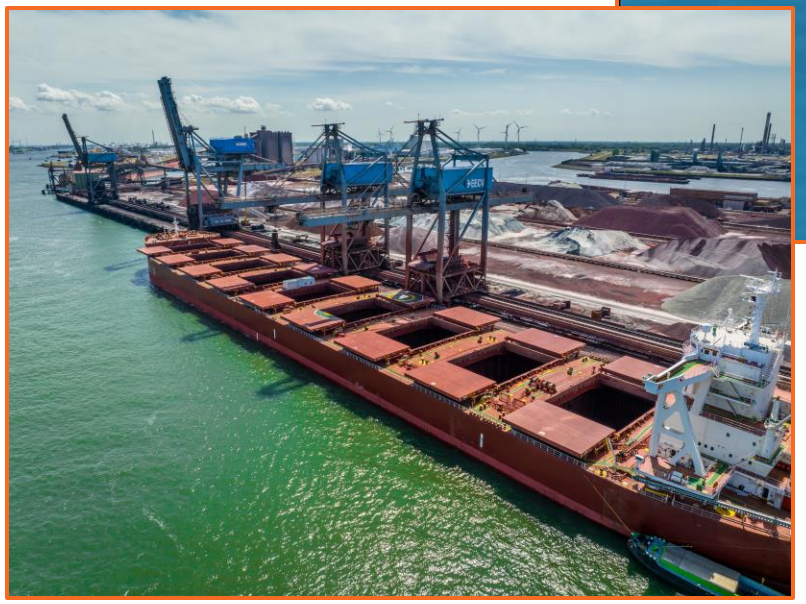


Special considerations for Bulk Vessel Shore Power designs

Challenge 1: Vessel movements

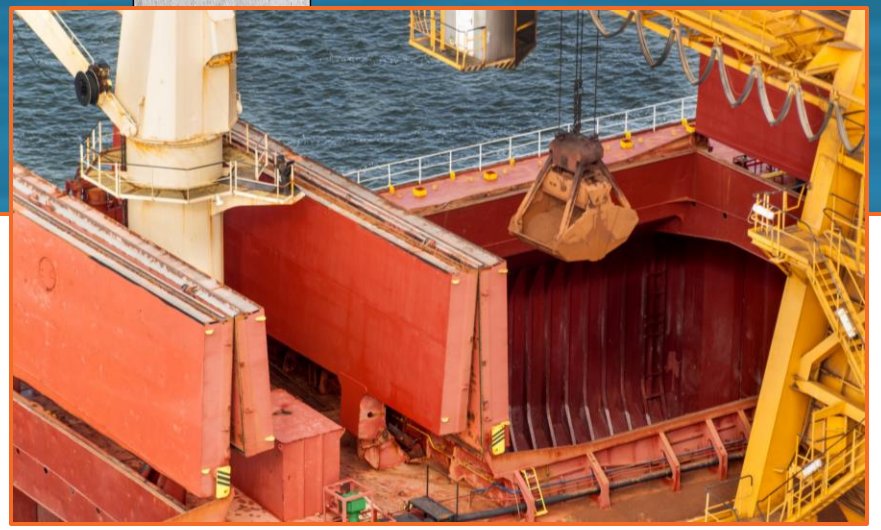
- Finger piers can require vessel shifts for the loaders to reach hatches
- Power supply connected while moving?





Challenge 2: Environment

- Abrasive materials
- Corrosive materials
- Marine environment



Challenge 3: EX areas shore & ship

- Keep designs away from EX areas
- Cable reels have slip rings
- Safer between the bridge and stern

Protection mark: DIN ISO 16016 --- © igus 2026 Shore Power Systems ---- Confidential and to be used for the intended project only



Retrofit of the existing power supply achieving:

- Less maintenance
- Use of Fiber Optic
- Use of water hoses
- Less power consumption due to reduced weigh on the crane

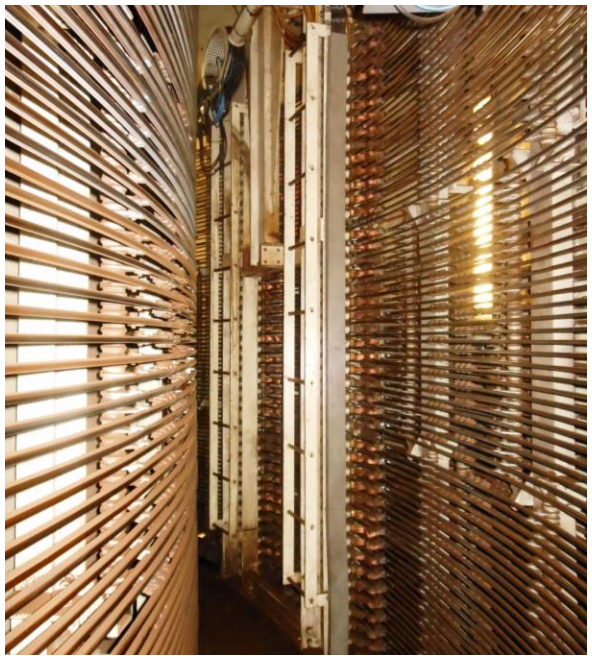
Cable drum



Festoon



Busbar



igus



Protection mark: DIN ISO 16016 --- © igus 2026 Shore Power Systems ---- Confidential and to be used for the intended project only



...cost savings on which crane?

LUBRICATION-FREE POLYMER BEARINGS IN BULK TERMINAL APPLICATIONS

igus®
plastics for longer life®

Improving Reliability, Safety and Sustainability in Bulk Handling Equipment



INCREASE RELIABILITY
Higher equipment availability

ENHANCE SAFETY
Reduce fire risk and manual greasing

PROTECT THE ENVIRONMENT
No grease leakage, no contamination

LOWER TCO
Less maintenance, less downtime, lower cost

Jon Mentxaka | igus España

ABTO BULK TERMINALS A CORUÑA 2026

Which ones may we exchange?



▶ Check out our brochures:











© igus GmbH, January 2023



Thank you for your attention!!!!!!



Jon Mentxaka
Product manager iglidur® igus S.L.U.

Tel.: +34 647 488 250
E-mail: jmentxaka@igus.net



How sustainable are motion plastics?

We look at plastics in three phases: during production, in use and at the end of the product's life.

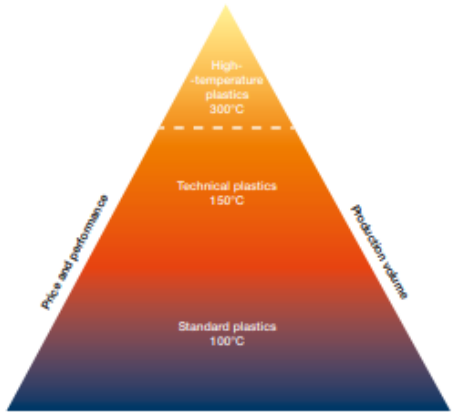
Before ...

99% recycled

99% of our rejects in injection-moulding production (sprues, defective parts) are recycled and returned to the manufacturing process.

Oil consumption

The production of high-performance plastics accounts for just 0.5% of global oil consumption.



clean igus® product range

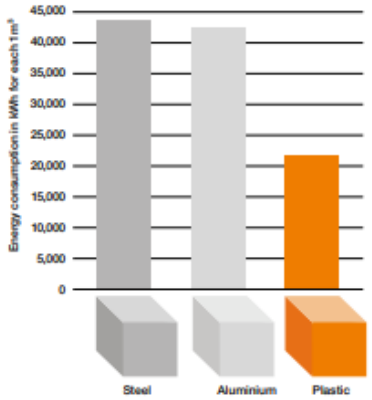
Mechanical measures such as magnetic foils, fixed conveyor belts and guide plates prevent parts from falling out of the machines in the production process and becoming waste. The waste ratio (production waste + processed material) could be reduced by 21% in 2021.

Power consumption

We are reducing the power of our machines and systems. We acquire injection moulding machines that are 40% more energy efficient. The power consumption was reduced by 11% in 2021, while increasing production.

Energy balance

Producing 1m³ of plastic requires around 50% less energy than producing 1m³ of steel or aluminium.



2025

Goals:
by 2025, we want our buildings and production to be CO_2 neutral.

During ...

Lubrication-free

Globally, 27 million tonnes of grease pollute the environment every year. Our plastics require no lubrication.

Service life

Our plastics are optimised for wear. They do not corrode or become damaged by grease and dirt. They last longer. We can say exactly how long.

Lightweight

A plastic plain bearing weighs an average of 1g, while a comparable steel bearing weighs 5g. The 200,000,000 plain bearings supplied to the automotive industry thus represent 800 tonnes of weight saved. Less weight = less energy/fuel to move the car.

Energy saving

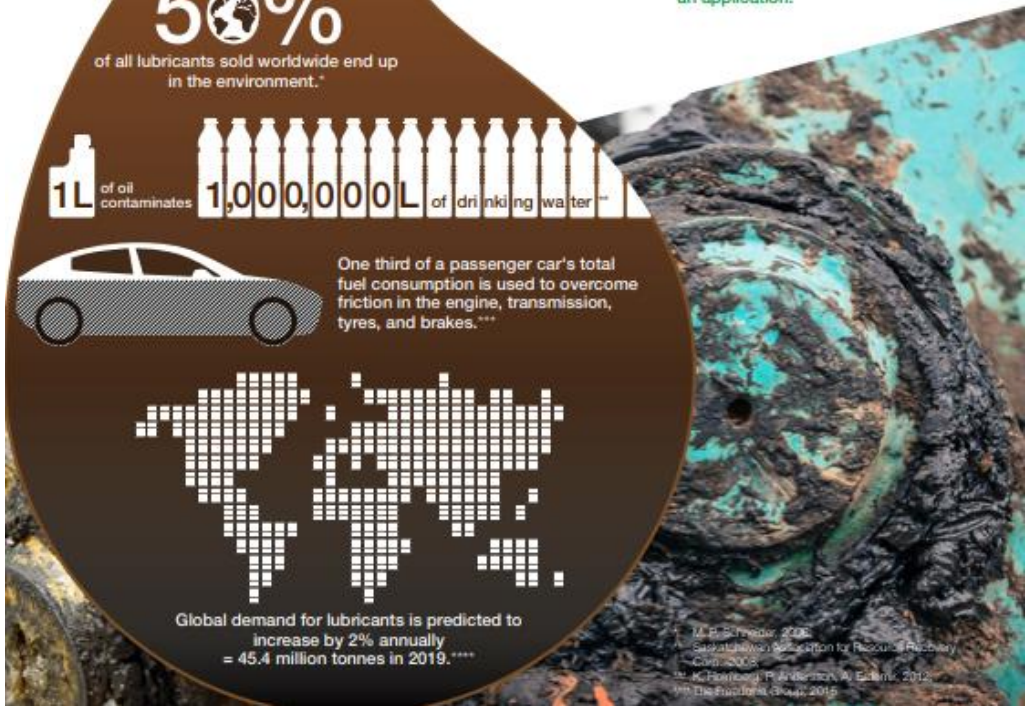
Our polymers are tribologically optimised and have low friction. Together with the lower weight, this ensures that less drive energy has to be used to move a machine part in an application.

50%
of all lubricants sold worldwide end up in the environment.*

1L of oil contaminates 1,000,000L of drinking water**

One third of a passenger car's total fuel consumption is used to overcome friction in the engine, transmission, tyres, and brakes.***

Global demand for lubricants is predicted to increase by 2% annually = 45.4 million tonnes in 2019.****



motion plastics®
Tech up. Cost down.
Innovation
Clean
Digital