

your global specialist

## Lifting your efficiency.

Specialty lubricants for port and terminal applications



# Lifting your efficiency



## Specialty lubricants from Klüber Lubrication – zero compromising on sustainability and performance

Equipment used in port and terminal operations is exposed to enormous stress and strain. The implications of a breakdown can be significant and costly. Klüber Lubrication offers tailor-made lubricants for all your port applications that significantly enhance performance, reliability, safety, and overall sustainability of your facilities. After all, it is the lubricant that has to ensure reliable operation of each machine element.

## Environmental protection and sustainability

The protection of our environment is becoming ever more important for operators of ports and terminals. They bear a special responsibility for seawater protection. With our environmentally sound specialty lubricants, outstanding functionality and environmental compatibility are no contradiction. Our lubricants are found in equipment in any ports, contributing to emission reduction, sustainability, energy efficiency, waste reduction and water protection. Wherever you are in the world, we can advise on the lubrication strategy and products you need to achieve your sustainability ambitions.

To contribute to the protection of the environment, we develop special lubricants that are biodegradable, non-toxic and non-bioaccumulative. Klüberbio lubricants meet the stringent requirements of the Vessel General Permit (VGP) for use in US territorial waters. They are certified as Environmentally Acceptable Lubricants (EALs). Klüber Lubrication already possessed the corresponding certificates, proving for example compliance with the OSPAR guidelines and the EU Ecolabel for lubricants, even before the VGP was introduced by law.

Klüber Lubrication specialty lubricants help reduce CO<sub>2</sub> emissions and support port operators on their way to a Green Port. Long relubrication intervals, as well as savings in the quantity of lubricant required, support sustainability and reduce operating costs over the entire lifecycle of a component.

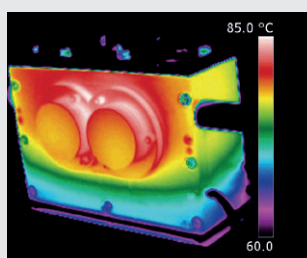
## Energy savings

Rising energy bills represent a significant cost driver in many industries. High energy consumption also negatively impacts your company's carbon footprint. Our lubricants and KlüberEnergy services can help you to reduce your energy consumption whilst protecting the environment.

We provide a professional report showing your saving potential and actual savings, using recognised measurement and verification methods according to international standards. This offers a high return on investment – KlüberEnergy projects pay back faster than other energy efficiency projects.

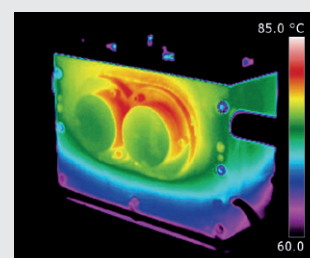
### Reducing oil temperature increases efficiency

Mineral oil ISO VG 220



$\vartheta_{oil} = 85\text{ °C}$

Klübersynth GEM 4-220 N



$\vartheta_{oil} = 80\text{ °C}$

Efficiency

Oil temperature  $\vartheta_{oil}$

## Improved occupational safety

Ports are often challenging places to work. Maintenance at great heights and on slippery surfaces poses a safety risk for workers. Klüber Lubrication specialty lubricants can help to minimise critical safety risks.

Adhesive lubricants reduce the danger of slippery surfaces, with no dripping even when exposed to high temperatures, salt water or heavy rain. The products' excellent wear and corrosion protection properties extend relubrication intervals and reduce maintenance frequency. Graphite-free lubricants ensure clean handling; users can easily recognise where grease has already been applied.

## Increased reliability and uptime

The marine environment found in ports and terminals is harsh and corrosive. Klüber Lubrication specialty lubricants protect equipment under these challenging conditions, even during long periods without use. This improves operational reliability, which is further increased by the lubricants' superior load-carrying capacity. Equipment lifetime is extended. These qualities also lead to reduced lubrication effort, hence more uptime.

## Reduced operational costs

Extension of relubrication intervals leads to lower lubricant consumption and reduced operating cost thanks to minimised service efforts. With only one lubricant for several applications, grease type stockholding is simplified.

### Open slewing gear lubricant

Adhesion is important for open gear and steel wire rope lubricants to prevent dripping down, especially in tropical temperatures or on sun heated surfaces.

Due to its unique composition, Klüberplex AG 11-462 shows excellent adhesion to metal. Customers benefit from reduced wear of machine elements and better corrosion protection.

#### In-house adhesion test



NLGI 2 open gear grease    Klüberplex AG 11-462

Pictures show 2.5 mm thick grease layer after 48 h at 70 °C on a vertically positioned sheet metal

#### Open slewing gear lubricated with



standard black lubricant

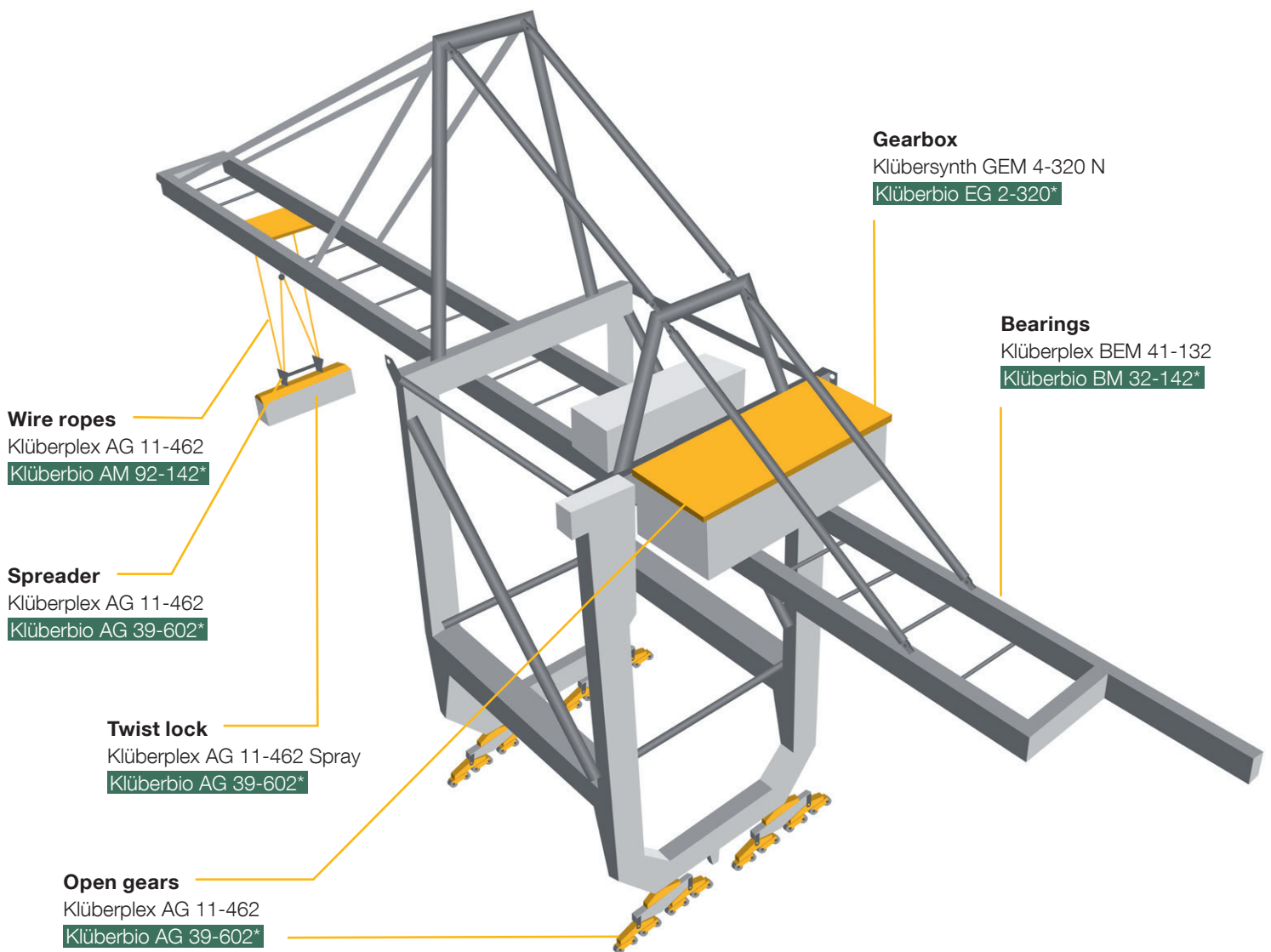


Klüberplex AG 11-462

**Result: Klüberplex AG 11-462 achieves better adhesion on metal surfaces at higher temperatures than other open gear lubricants.**

# Selection of our specialty lubricants for cranes

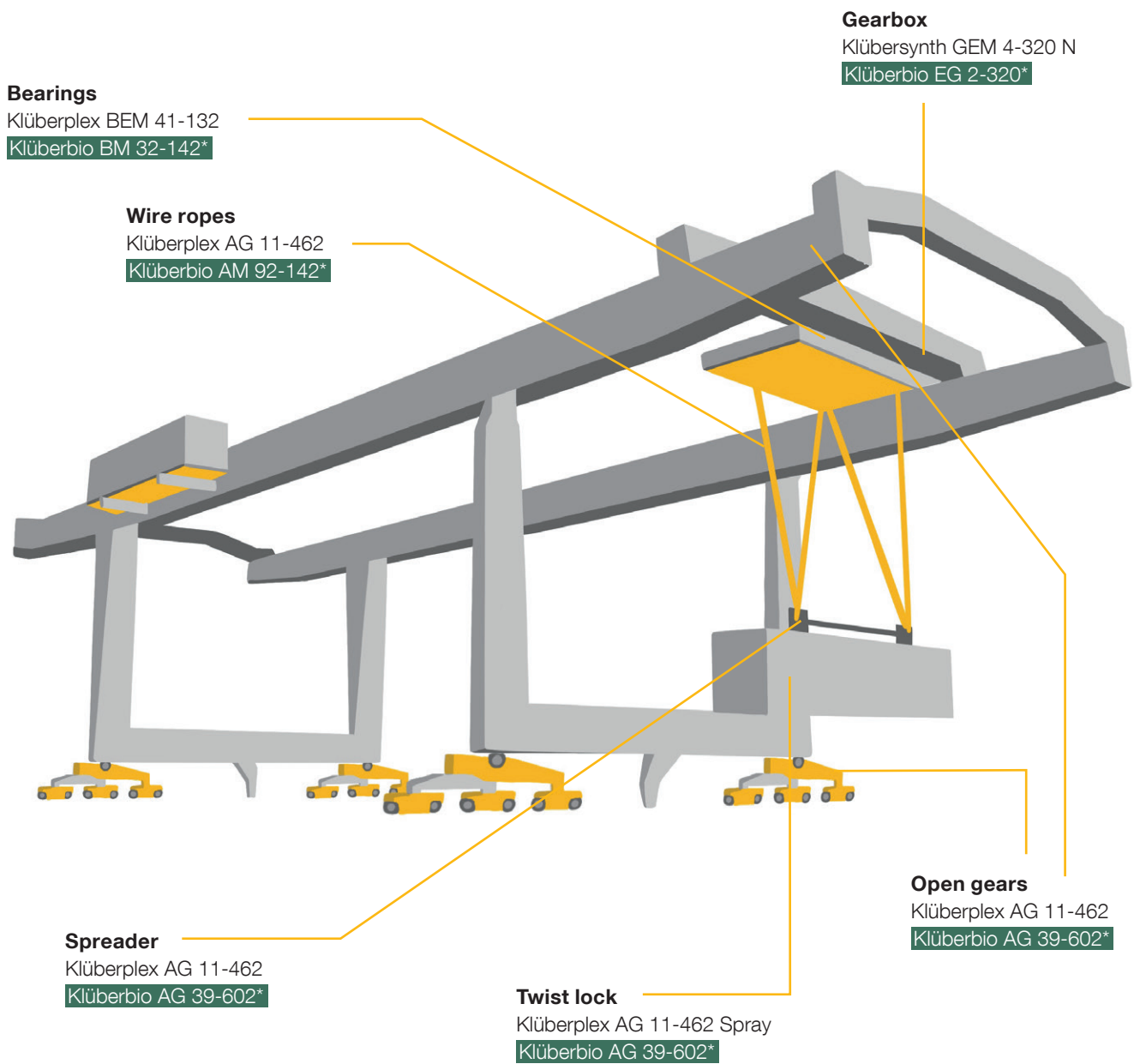
## Ship-to-shore (STS) crane



\*Biodegradable lubricant

These illustrations show a non-exhaustive selection of lubrication points on a ship-to-shore crane and a rubber-tired gantry crane.

## Rubber tyred gantry (RTG) crane



## Specialty lubricants from Klüber Lubrication – the benchmark for port and terminal equipment

Klüber Lubrication is the global market leader in specialty lubricants and tribological high-end solutions. Companies from a wide variety of industries have relied on our competence and know-how for decades. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets.

We have more than 90 years of experience in designing lubricants in close cooperation with leading OEMs. This has allowed our experienced, competent staff to develop a benchmark-setting innovative product range right at the forefront of lubrication technology, which is well established and proven in practice.

Our products are globally available with consistent outstanding quality, while one of our tribology experts is always at hand and ready to help.





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## Klüber Lubrication – your global specialist

Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 90 years.

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