

WHITEPAPER

# **Extend the service life of your steel wire ropes**

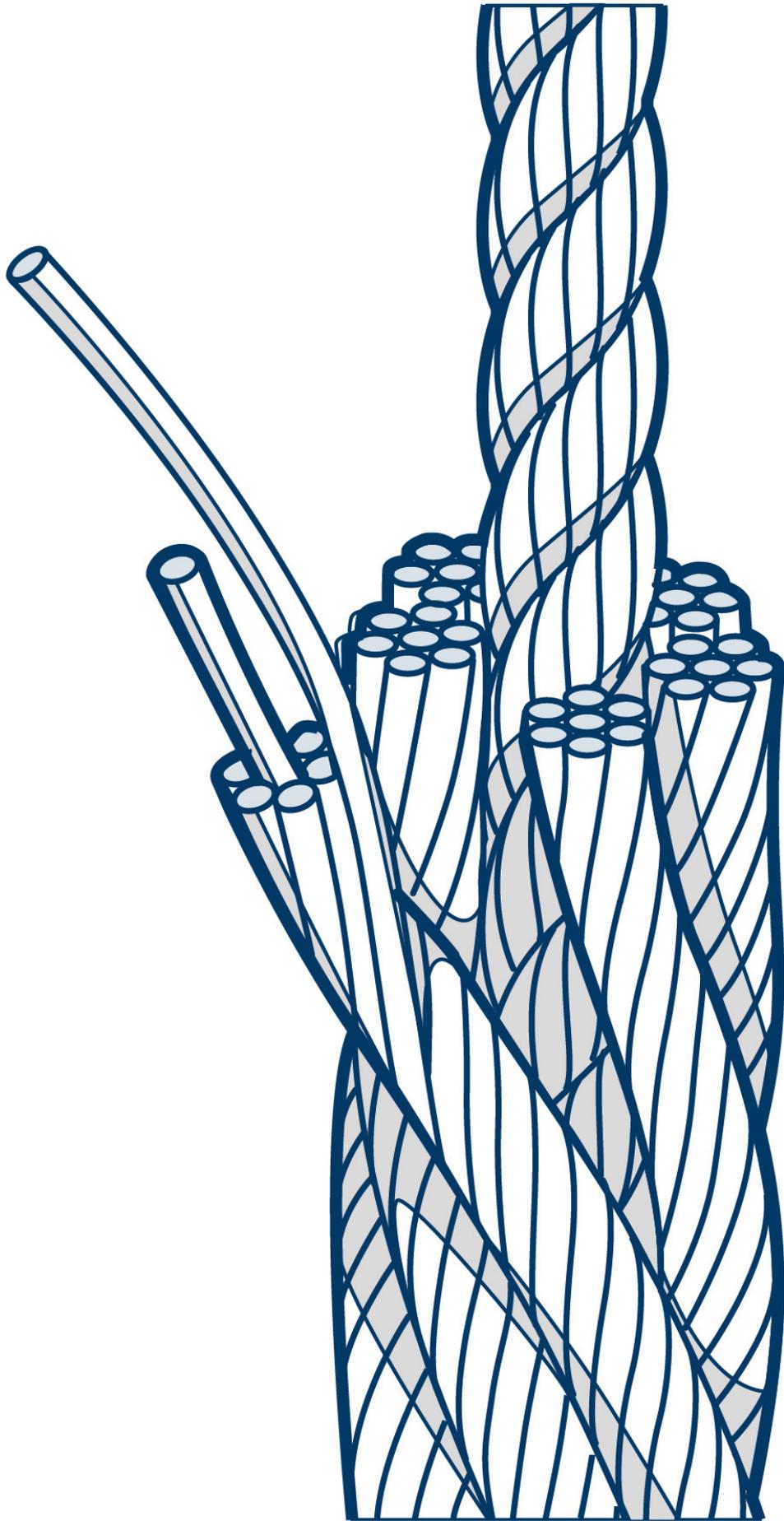
**Ropetex steel wire rope lubricants**

**ROPETEX**



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A wire rope is a complex mechanical machine.

# Why do steel wire ropes need lubrication?

The service life of a steel wire rope is affected both internally and externally. If no precautions are taken, these factors could shorten the service life of your valuable steel wire rope. Let's take a look at both factors, and what you can do to prevent damage to your ropes.

## Internal factors

A steel wire rope is a complex mechanical machine. It generally consists of a few to several strands, which in turn consist of a few to several wires. All these wires and strands are wrapped around a core in a helix shape. In some rope constructions, the twist direction is the same. In others, the outer and inner strands and/or core are laid in the opposite direction.

When the rope is loaded, all wires and strands begin to move relative to each other to properly absorb the forces. With a steel wire rope that is used on a winch or a crane, this results in a continuous dynamic load, and thus a continuous friction of the strands and wires in the rope itself. Since these are always steel-to-steel contacts, wires and strands quickly wear out.

## External factors

In addition to internal factors, there are many external influences against which a steel wire rope must be protected. First, there are environmental factors that could damage the steel wire rope. Weather conditions such as acid rain, salt water, temperature fluctuations, and emissions of harmful gases and dust. Second, contact with the sheaves, the winch drum and in some cases even the load or the surface could also wear down the rope.

## Protection

Fortunately, it is possible to protect wire ropes against these internal and external influences. By regularly relubricating the steel wire rope with a suitable wire rope lubricant, you can extend the service life of the rope considerably.



# What makes a good wire rope lubricant?

A good steel wire rope lubricant has properties that minimize internal friction and wear, while providing protection against harmful external influences. However, these are just the basic requirements.

## Environment and application

For different environments and applications of steel wire ropes, additional properties are required. For example, protecting a wire rope in a humid and tropical climate requires a different lubricant than a dry and dusty environment.

Similarly, a tow rope deals with completely different variables compared to a rope running on a tower crane, it is therefore important to consider the application of the steel wire rope when you look at the requirements of your lubricant. Keep in mind that additional requirements may exist in the field of sustainability, such as biodegradability.

## Important properties for lubricant

Due to the variety of applications and environments in which wire ropes are used, there is no such thing as “the perfect wire rope lubricant”. Depending on the environment and the application of the rope, important properties for a steel wire rope lubricant need to be:

- Excellent at resisting corrosion
- Good at penetrating the rope
- Good at displacing moisture
- Expelling rust and dirt
- Reducing internal friction
- Adhesive to the rope, especially on galvanized ropes
- Stable over a wide temperature range
- Not sticky, to avoid dust and dirt from sticking to the rope
- Heat resistant
- Resistant against becoming brittle when cold
- Smoothen traction on the sheaves
- Long lasting, meaning the product doesn't immediately wash off
- Environmentally friendly and / or biodegradable

Before applying a lubricant to a wire rope, one must make sure it is suitable for the desired application and environment.

The Ropetex range of wire rope lubricants offers several products. Each is tailored to a specific application and environment.

Allowing you to use the lubricant that best suits your situation.

For more details, check the product datasheets at the end of this whitepaper.



# Before lubricating a steel wire rope

Before applying the new lubricant to the wire rope, it is important to thoroughly clean it. Cleaning the wire rope removes the old (and often dried) lubricant and other contamination from the wire rope. A clean rope will absorb new lubricant much easier, allowing the lubricant to protect your steel wire rope as best as possible.

Cleaning a wire rope can be a labor-intensive job. A wire brush is often used, which is effective but time consuming. Luckily, devices have been developed for this purpose. They are available on the market and clean the rope using rotating brushes.

After cleaning your steel wire rope, it is good to conduct a visual inspection to be certain that it is still in a good condition.

Inspection of steel wire ropes must be carried out by a competent person, according to applicable standards.

## **Warning!**

A heavily corroded steel wire rope must not be lubricated! This is extremely dangerous and can cause spontaneous rupture. Heavily corroded wire surfaces can hold the ropes together in certain situations due to high friction. Adding a lubricant can remove that friction and cause the rope fail. A severely corroded rope should be discarded immediately.

# How to apply lubricant to a steel wire rope

Wire rope lubricants can be applied using different methods. It all depends on the product and the environment. General application methods are:

- Spraying as aerosol or with a (portable) sprayer
- Dripping
- Swabbing
- Brushing
- High Pressure Lubricator

In general, liquid and penetrating lubricants are applied by spraying and dripping. Gel or paste lubricants must be applied by swabbing, brushing or a pressure lubricator.

The best results are achieved by using a high-pressure device. This is because only this device really penetrates the lubricant into the steel wire rope core (if not a plasticized one). Devices such as these can be supplied by or sometimes even hired from your Ropetex lubricant agent.

## Where to apply the lubricant

If you use a high-pressure device, a lubricant can be applied anywhere on the running rope. If you use manual methods, the best place to apply lubricant is at a wire rope bending point. Often, this is at a sheave or at the drum. Why is this so important?

Because application at a bending point causes the rope strands to slightly separate from each other, giving the lubricant the opportunity to penetrate the core of the rope. Whether you use a high-pressure device or manual methods, it is always important that the bending points and the place where the wire rope touches the sheave are well lubricated. As the rope suffers the most from mechanical stress in these places.

## When to lubricate a steel wire rope

How often does a steel wire rope need to be lubricated? That depends on the use. German Standard DIN15020 says: "Steel wire ropes must be relubricated at regular intervals, depending on their use, particularly along the zones subjected to bending. If for operational reasons relubrication cannot be carried out, shorter service life of the rope is to be expected and the inspection intervals have to be arranged accordingly."

What about the lubricant that is already in the wire rope? Keep in mind that in most cases the lubricant from the factory is mainly there to protect the wire rope during transportation and storage. In other words: before the rope enters its service life. It is therefore important to relubricate as soon as possible, preferably after installing the new rope onto your crane or lifting installation.

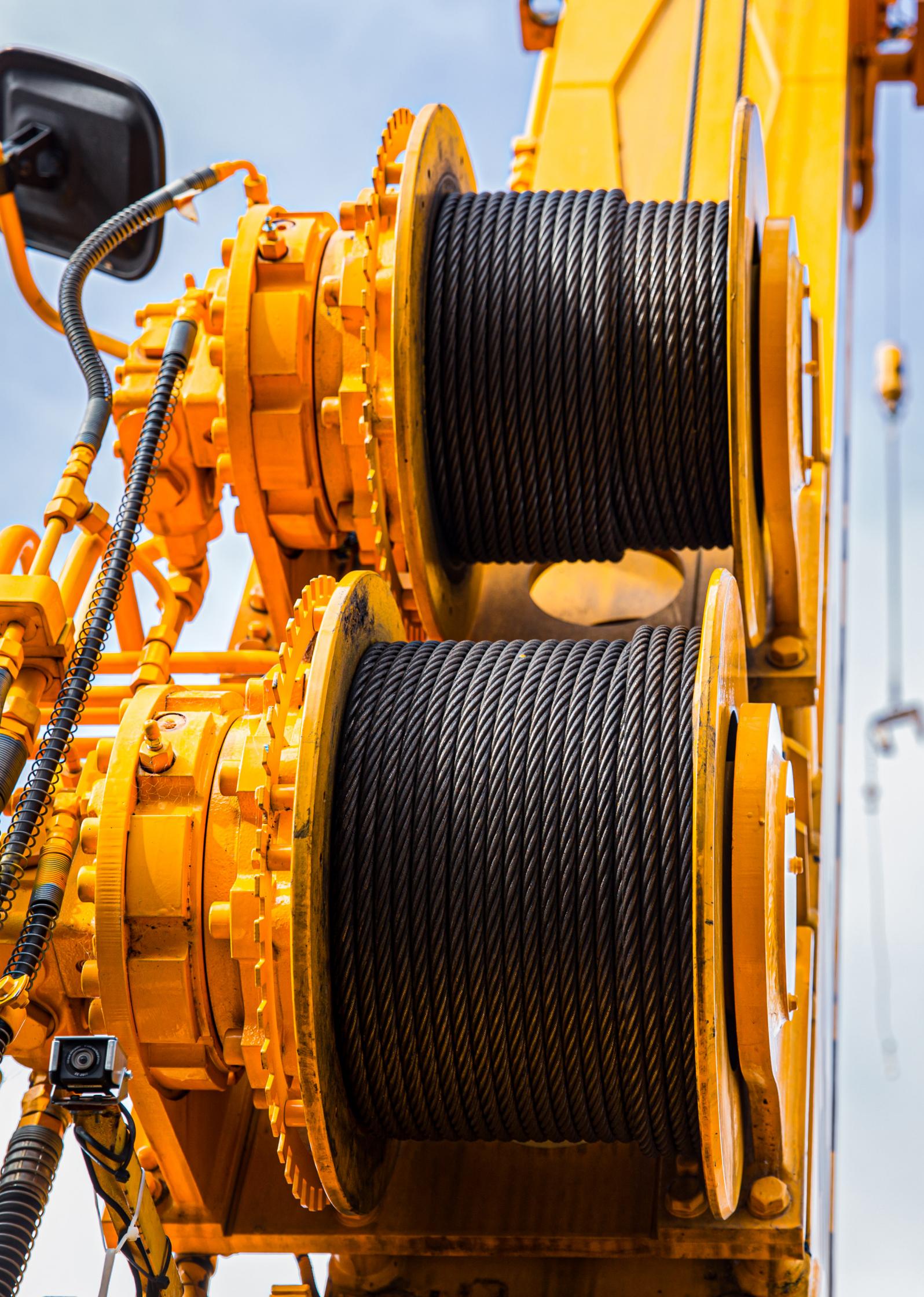
For general industrial applications we recommend relubricating a steel wire rope between 3-5 times during its service life.

That's why it is important to use just enough lubricant. The following formula can be used as a basic rule of thumb:

**How much lubricant is needed?**

In most cases, too much lubricant is applied to the rope. But why is this an issue? First and foremost, the use of too much lubricant is an unnecessary waste of product. In addition, it causes the lubricant to completely seal up the rope, which will probably cause internal corrosion. Even worse, too much lubricant can contaminate the installation or crane when the excess product starts to drip off the rope.

$$\text{Lubricant needed (KG)} = \frac{\text{Rope weight per meter} \times \text{rope length in meter}}{100}$$



# What lubricant is needed for an environmentally sensitive environment?

It's important and often mandatory to use environmentally friendly lubricants in and near open water environments like docksides, bridges, locks, and offshore installations. These lubricants are also known as EALs (Environmentally Acceptable Lubricants).

We recommend Ropetex Ultra Lube 2, which was specially developed as an EAL. It's biodegradable, non-toxic and non-bio accumulative. Ropetex Ultra Lube 2 is therefore very suitable for open water environments. It also complies with the Vessel General Permit (VGP) 2013 of the EU Ecolabel Certification. In conclusion: the Ropetex Ultra Lube 2 is an excellent lubricant that is even suitable for tropical environments and deep-water applications.



# Ropetex Steel Wire Rope Lubricants

Ropetex Lubricants for steel wire ropes are a range of lubrication products especially designed and formulated for the purpose of extending the service life and improving performance of steel wire ropes. The products are created using our extensive knowledge and practical experience of working with steel wire ropes.

The range consists of 4 products in several packing units that cover all market needs.

## Application Overview for Ropetex Lubricants

**ROPETEX**  
thin lube 30

**ROPETEX**  
traction lube 40

**ROPETEX**  
heavy duty lube 70

**ROPETEX**  
ultra lube 2  
(Ecolube)

Application area	Thin Lube 30	Traction Lube 40	Heavy Duty Lube 70	Ultra Lube 2
General industrial lifting	•			
Winch ropes	•			
Tower cranes	•			
Mobile cranes	•			
Dockside cranes	•			•
Fishing ropes	•			
Lifts & Elevators		•		
Traction Hoists		•		
Offshore Cranes			•	•
Standing Rigging			•	
Mooring Ropes			•	
Tower ropes			•	
Outdoor winches			•	
Offshore installations				•
Port cranes				•
Subsea installations				•
Tropical Environment				•

# Product datasheet

## Ropetex Thin Lube 30

Ropetex Thin Lube 30 is a semi-dry thin film lubricant that can be utilized in a wide range of applications, both in industry and construction. It has excellent penetration and corrosion resisting properties. Thin Lube 30 also minimizes wear between the wires and strands of a steel wire rope, and is therefore perfect for frequent use in harsh working conditions. It also consists of components that reduce abrasive particle contamination, the probability of lubricant 'flinging off' and a lubricant build-up.

**Typical applications:** General industrial lifting, winch ropes, tower cranes, mobile cranes, dockside cranes and fishing ropes

**Application methods:** Portable sprayer or brushing/dripping

**Minimum application temperature:** -5°C (product should be kept to at least 10°C for 48 hours before application)

**Operation temperature:** -30°C to +60°C

**Color / texture:** Brown Opaque Fluid

**NLGI grade:** Solvent Liquid

**4-ball weld load:** > 100 kgf



Available product quantities & packaging

Quantity / Packaging	Product Description	Part Code
400 ml aerosol	Ropetex Thin Lube 30, 400 ml aerosol	142500040010
5 liter can	Ropetex Thin Lube 30, 5 liter can	142500500010
20 liter drum	Ropetex Thin Lube 30, 20 liter drum	142502000010

# Product datasheet

## Ropetex Traction Lube 40

Ropetex Traction Lube 40 is a synthetic lubricant which coats wire surfaces with a slip-resistant film. It is designed for situations in which frictional grip is vital, because it provides internal lubrication whilst avoiding excessive build-up with repeated applications.

**Typical applications:** Lifts, elevators and traction hoists

**Application methods:** Portable sprayer or brushing/dripping

**Minimum application temperature:** -5°C (product should be kept to at least 10°C for 48 hours before application)

**Operation temperature:** -55°C up to +40°C

**Color / texture:** White water fluid

**NLGI grade:** Solvent Liquid

**4-ball weld load:** > 110 kgf

**ROPETEX**  
traction lube 40

Available product quantities & packaging

Quantity / Packaging	Product Description	Part Code
20 liter drum	Ropetex Traction Lube 40, 20 liter drum	142502000020

# Product datasheet

## Ropetex Heavy Duty Lube 70

Ropetex Heavy Duty Lube 70 is a medium thixotropic gel lubricant with stable properties over a wide temperature range. It offers excellent corrosion protection against marine working conditions. Heavy Duty Lube 70 is formulated for long life on static or dynamic ropes in highly aggressive environments. Additionally, it has a good wash-off performance.

**Typical applications:** Offshore cranes, standing rigging, mooring ropes, tower ropes, outdoor winches

**Application methods:** High pressure equipment or brushing

**Minimum application temperature:** -20°C

**Operation temperature:** -40°C up to +70°C

**Color / texture:** Glossy Black Gel

**NLGI grade:** 0

**Hot salt spray test:** 720 hours

**4-ball weld load:** > 180 kgf

**ROPETEX**  
heavy duty lube 70

Available product quantities & packaging

Quantity / Packaging	Product Description	Part Code
12,5 kg pail	Ropetex Heavy Duty Lube 70, 12,5 kg pail	142501250040

## Product datasheet Ropetex Ultra Lube 2



Ropetex Ultra Lube 2 is an ecofriendly, advanced high-performance hybrid grease. It is developed to perform in dockside, offshore and deep-water environments. Furthermore, it has superior wash-off performance and is bio-degradable, non-toxic and non-bio accumulative. Ropetex Ultra Lube 2 is an Environmentally Acceptable Lubricant (EAL) and is fully VGP 2013 compliant. It can therefore be used on docksides, riversides, lakes and other environmental sensitive locations.

Due to the composition of the product, it is stable over a wide temperature range, making it suitable for tropical environments.

**Typical applications:** Offshore cranes, dockside cranes, offshore and harbor installations, subsea installations

**Application methods:** High pressure equipment or brushing

**Minimum application temperature:** -5°C (product should be kept to at least 10°C for 48 hours before application)

**Operation temperature:** -40°C to +120°C

**Color / texture:** Matte Black Grease

**NLGI grade:** 2

**Drop point:** 154°C

**Break point:** -60°C

**Relative density:** 0.9 - 0.95

**Hot salt spray test:** 2880 hours

**4-ball weld load:** > 400 kgf

**4-ball weld scar :** 0,55 mm

**Water spray-off:** < 60% retention

**Environmentally Acceptable Lubricant:** YES

**VGP 2013 compliant:** YES

**ROPETEX**  
ultra lube 2

Available product quantities & packaging

Quantity / Packaging	Product Description	Part Code
12,5 kg pail	Ropetex Ultra Lube 2, 12,5 kg pail	142501250050