

## Speciality Lubricants for Open Gears

Eco-compatible increased wear protection even at low temperatures

### Excellent performance, whatever the weather

In all kinds of weather Anchor Handling Tug Supply (AHTS) ships move and position oils rigs and their anchors. Using powerful winches, they tow platforms to new positions, they supply the rig crews with all materials and equipment needed for offshore operations, and in emergencies these vessels can serve as emergency rescue and recovery vessels (ERRV). For these reasons anchor winches must operate with the upmost reliability - any anchor winch failure on an AHTS vessel can have severe consequences for the operator, which is why it is important to select the right lubricant for the conditions the AHTS is operating in.

Damage to the gear teeth for example is particularly problematic, as it is almost impossible to replace a gear rim while the ship is at sea, therefore the ship would have to come out of service while replacement parts are found and fitted. For this reason major oil companies demand near seamless performance from the vessels that service its offshore oil and gas structures, which is why selection of the right lubricant is paramount. Based on years of experience and research, Klüber Lubrication developed adhesive lubricants precisely tuned to the operating conditions prevailing in open gear drives.

Following a positive experience with speciality lubricants for open winch drives a leading Scandinavian ship equipment OEM now recommends lubricants from Klüber Lubrication to their customers.

The selection of lubricant for open winch gears is dependent upon a number of design and application factors, for example upon manufacture gear flanks usually still show a degree of surface roughness which along with misalignment of the gear rim and pinion can result in the load carrying area being no more than 50%.

### Anchor winches are required to operate with the upmost reliability



When in mesh these factors can result in the load-bearing tooth flanks suffering partial overloading, which in turn can lead to excessive wear and tooth flank damage, therefore running-in lubrication plays a vital role. New girth-gear drives are usually subjected to a specific running-in process, for example with GRAFLOSCON B-SG 00 Ultra, depending on the winch design. During loaded operation, controlled micro-wear is intentionally provoked to smooth the tooth flanks. The consequence is a higher load-carrying area of approximately, 80%, which helps to avoid overloading and gear damage.

Running-in lubricants may only be applied over a limited time and must be replaced by the operating lubricant when running-in is completed.

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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 85 years.

## Challenges encountered during operation

On AHTS vessels the large open gears in winch drives are subject to strong tensile loads at the anchor chain and shock loads with a high surface pressure. Usually the winches are only operated for a short time during hauling or anchor handling therefore the gear lubricant is applied by means of transfer lubrication, i.e. only while the drive is in motion, but as peripheral speeds are usually low, the drives run frequently under mixed friction conditions, which means a sufficient hydrodynamic lubricant film is not generated, so the tooth flank surfaces are partly in direct contact. The consequences can be excessive wear and damage to the tooth flanks in the form of pitting, pitting is caused when the permissible load on the gear material is exceeded locally and micro-cracks form near the surface, leading eventually to spalling. This diminishes the load-carrying area of the tooth flanks, encouraging further pitting. A suitable lubricant is, therefore one that builds up a load-bearing reaction layer even at low peripheral speeds and high surface pressure to protect the pinion and gear rim flanks reliably against wear.

## Operating under extreme conditions

AHTS vessels operate in a wide variety of climates and are permanently exposed to the aggressive salty air and spray water, therefore it is essential that the lubricant spreads well, adheres firmly to the components and does not drop off so as to protect the tooth flanks against corrosion.

The lubricants selected also have to be pumpable by means of the lubricating systems installed at all temperatures. Klüber Lubrication developed Klüberfluid C-F 3 Ultra for ambient temperatures up to + 30 °C, and Klüberfluid C-F 3 M Ultra for ambient temperatures above + 30 °C. The lubricants of the Klüberfluid series are transparent, highly viscous adhesive lubricants with good properties aimed at a long component life. According to the manufacturer, reliable lubrication can be attained with 50% less lubricant.



## About the company

Klüber Lubrication is the acknowledged global market leader in providing innovative lubrication solutions that solve problems, provide greater product durability, increase energy efficiency, and improve overall lifecycle cost reduction for equipment assets.

An affiliated brand of the Freudenberg Technology Group, we have been developing high-end tribological solutions and ambitious technical concepts for over 85 years, and are known internationally for our substantial number of OEM approvals from world leading manufacturers of food, beverage and pharmaceutical equipment. We are a clear leader in the market when it comes to problem-solving, optimisation, continuous improvement, cost control and best practice, continuing to meet the ever-increasing demands on industry to deliver reliability, sustainability and overall equipment effectiveness whilst maintaining consumer safety – **we are your global specialist.**

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