



Together in Motion

soLITE[®]

The high-strength fiber rope for cranes.
The answers to your questions!

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soLITE®

The intelligent high-strength fiber rope for use in cranes

soLITE® is the high-strength fiber rope that TEUFELBERGER and Liebherr developed for use in cranes. A new technology for previously unusual applications may arouse some uncertainty which we'd like to dispel below.

1. How can I determine the point of discard of soLITE®?

Other than with comparable fiber ropes, the point of discard can be determined via several systems functioning independently of each other.

- Visually via a cover wearing in several stages: It consists of high-strength fibers of various colours wearing at different times. As soon as the fibers of the cover are worn the red core of the kernmantle design appears. This is a clear sign that soLITE® should either be discarded or returned to TEUFELBERGER for inspection.
- Via electronic Condition Monitoring: This system functions independently of and redundantly to the wearing cover. Indicators in the load-bearing core of the rope show the user if the rope can still be safely used or has to be discarded.
- Via external data recording at the crane: The evaluated parameters are another way of estimating the residual service life.

Due to this multi-level, redundant system to determine the point of discard soLITE® can be safely used for every application.



2. Can a steel wire rope be replaced by soLITE® in an existing crane or is there any conversion work required at the crane?

Generally, a steel wire rope installed in an existing crane can be replaced by soLITE®. However, some measures have to be taken.

- To handle identical working loads while ensuring the same safety factors, a fiber rope will be 2 to 4 mm thicker in diameter. Therefore, it must be checked before conversion if the rope with the bigger diameter can be properly spooled on the winch. If this is possible, the condition of the winch must be checked for being free from sharp edges and other wear.
- In case of multi-layer spooling the steel wire rope should not be replaced by a fiber rope without replacing the winch as well, since a fiber rope's lower dimensional stability under lateral pressure will increase the pre-stress on the flanges of a winch designed for steel wire ropes. As a consequence, the flanges might break, which presents a safety risk.
- In case of tower cranes, care should be taken that the hoisting winches are positioned properly. This may influence the stability of the crane.

3. What about the spooling behavior as well as wear and tear in multi-layer spooling systems compared to a customary steel wire rope?

In case of the tested Lebus grooving of the drum, the spooling pattern of soLITE® is the same as that of a steel wire rope. Therefore, there is no difference in operation for the user. This is due to the special soLITE® design which features all the characteristics of a steel wire rope that are relevant for a high spooling quality. The wear and tear of soLITE® in a multi-layer spooling system is considerably lower due to the special cover.

4. What is the elongation to be expected when using soLITE®?

soLITE® elongates when operated under load. The elasticity of this fiber rope is approx. 20-30% higher than that of comparable steel wire ropes (depending on the design). Thus, soLITE® provides for a “softer” response during loading/unloading.



5. What about the cost-benefit ratio of soLITE® compared to that of a customary high performance steel wire rope?

The higher acquisition costs of a fiber rope are compensated over the whole utilization phase of soLITE®. The lower costs over the entire lifecycle and the additional benefits are conspicuous:

- 80% less weight, therefore easier handling, and up to 200% higher load capacities at the crane
- Quicker re-reeving (from 7 to 3 in 10 min)
- Environmentally friendly - no lubricants
- No wear of crane components such as sheaves, drums, ...
- Many times longer service life => higher crane availability
- Easy determination of point of discard

6. Can the service life of soLITE® in its applications be compared to that of a customary high performance steel wire rope?

In practice-oriented testing (6-fold reeving and multi-layer spooling) on special realistic test rigs of Liebherr and tested at a constant maximum load (Sf 4), soLITE® has achieved a 10 - 15 times longer service life compared to a customary high performance steel wire rope. In other trials testing soLITE® with cut-ins up to 2 layers deep a 20 - 50 times longer service life could be achieved.

7. What about the influence of chemicals or environmental conditions (rain, saltwater, UV, sand, dust, ..) on the properties of soLITE®?

The load-bearing fibers of the core are highly resistant to chemicals and/or oils and protected against environmental influences in several ways (protective cover, special coatings, etc.). However, contact with concentrated chemicals, acids and lyes should be avoided because they might adversely affect the service life of the rope. Sands or other particles may lead to a quicker wear both of the rope drum and the high-strength fiber rope.

8. If soLITE® gets damaged, can it be repaired?

This question cannot be answered in general terms. The possibility of repair must always be assessed individually for each specific case.

9. Does the rope need maintenance?

soLITE® does not require any lubrication or other maintenance. Regular visual inspection and thorough cleaning of the rope will benefit the preservation of service life.

10. How does soLITE® respond to different (extreme) temperatures?

Being made of high-strength synthetic fibers, the rope core of soLITE® will wear faster in bending operation when ambient temperatures are high. However, any possible reduction of the rope's service life that may occur as a consequence can be assessed by TEUFELBERGER's Condition Monitoring System. At any rate, this fiber rope must not be used at ambient temperatures of more than 50°C.

Ice and snow do not affect the breaking force, although the rope will become stiffer when there are low temperatures and ice. Here, too, if the rope chafes over ice and snow all the time, the condition of the rope has to be inspected at shorter regular intervals.

