



Together in Motion

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soLITE®

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

soLITE[®]

The intelligent high-strength fiber rope for use in cranes

soLITE[®], developed by TEUFELBERGER, is a high-strength fiber rope for use on cranes. Putting a new technology to use in unprecedented ways may generate doubts that we would like to dispel in the following paragraphs.



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 mutually independent methods.

- Visually, via a cover wearing in three stages: This cover consists of high-strength fibers of various colors wearing at different speeds. As soon as the fibers of the cover are worn, the red core of this kernmantle rope will become visible. This is a clear sign that a soLITE[®] rope should either be discarded or returned to TEUFELBERGER for inspection.
- Via external data acquisition at the crane (optional): evaluating the relevant parameters is another way to estimate the residual service life.
- Via electronic condition monitoring (optional): This system functions independently of, and redundantly to, the wearing cover. Indicators in the rope's load-bearing core show users if it is still safe to use the rope or if it has to be discarded.



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.
- On multilayer-spoiled winches, it is necessary to verify, before replacing the steel wire rope by a fiber rope, whether or not the winch is able to cope with the fiber rope's lower dimensional stability under lateral pressure. The pressure on the flanges will increase and could, in the worst possible case, cause the flanges and/or the drum body to break.
- In the case of tower cranes, in view of the lower rope weight, care should be taken that the hoisting winches are positioned properly. This may influence that 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 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
- Quick re-reeving (from 7 to 3 strands in 10 minutes)
- 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, under a constant maximum load (Sf 4), soLITE® achieved a 10–15 times longer service life compared to a market-standard high performance steel wire rope.

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?

Generally, it is possible to repair the cover, provided that the load-bearing core has remained undamaged. Whether or not such repair is possible / makes sense must be assessed separately for each specific case.

9. Does the rope need maintenance?

soLITE® does not require any lubrication or other maintenance. Regular visual inspections and thorough cleaning of the rope when heavily soiled help achieve the rope's maximum service life.





soLITE®

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

The load-bearing core of soLITE® consists of high-strength synthetic fibers. In high ambient temperatures, the rope core of soLITE® will wear faster when bent in use. However, the potentially resulting reduced service life of the rope can be determined by using the methods for the determination of the point of discard described in Chapter 1. The service temperature range of soLITE® is currently defined as extending from -40 °C to +40 °C. If you would like to use soLITE® outside this range, please contact TEUFELBERGER. Generally, fiber ropes should be kept away from all heat sources (flying sparks, exhaust pipes, fires, ...).

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.