Teufelberger

soLITE®

The high-strength fiber rope
for lifting applications.

Together in Motion

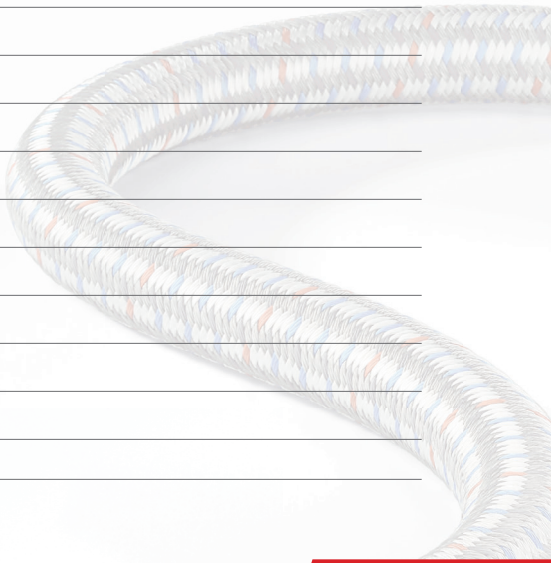
soLITE® is the intelligent high-strength fiber rope to be used for challenging lifting applications and, in particular, on mobile, crawler cranes and tower cranes which have so far been equipped with steel wire ropes only. The innovative rope design has been developed by TEUFELBERGER in cooperation with LIEBHERR. On the following pages, we would like to answer some questions about this new technology developed specifically for lifting applications.

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

Other than with comparable fiber ropes, the point of discard of soLITE® can be determined via several mutually independent methods:

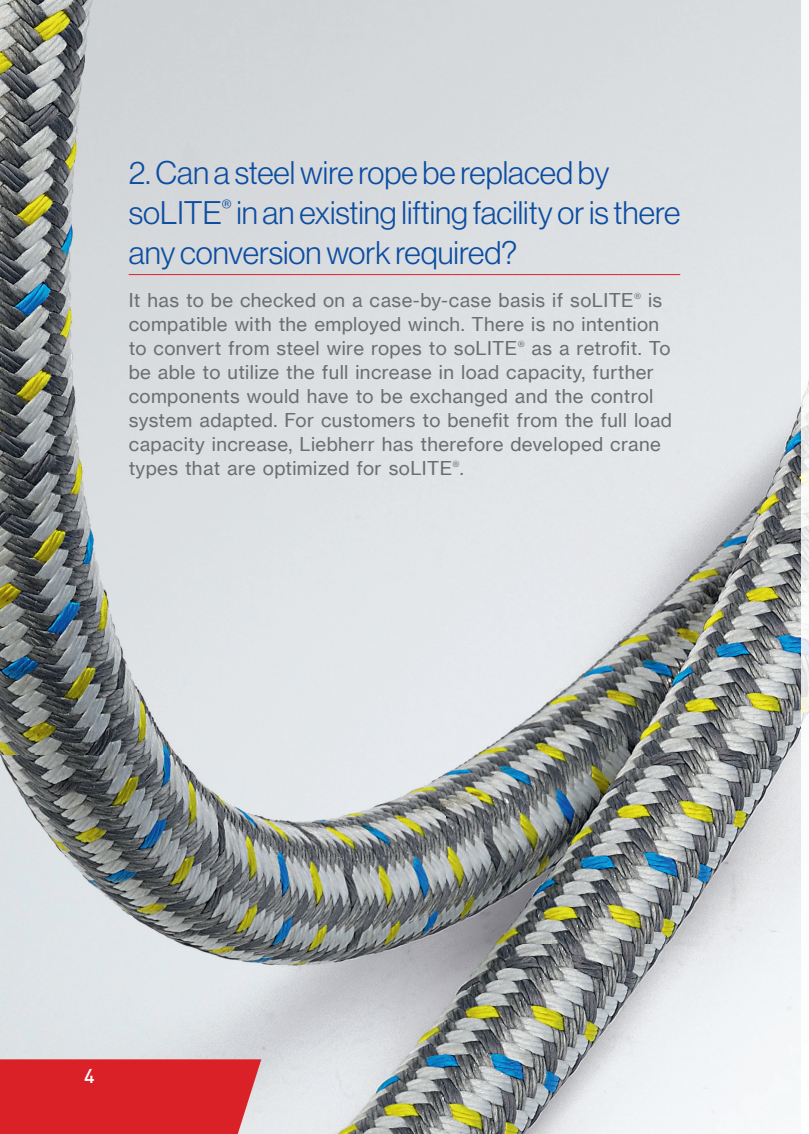
- Visually, via a cover wearing in three stages: The cover consists of different fibers of various colours wearing at different speeds. As soon as the fibers of the cover are worn, the red core of this laid kernmantle rope will become visible. This is a clear sign that soLITE® has to be discarded.
- Via external data monitoring at the crane

Moreover, the FEM 5.024 standard, which has been in force since 2017, defines special guidelines regarding the point of discard to ensure the safe use of high-strength fiber ropes in cranes.



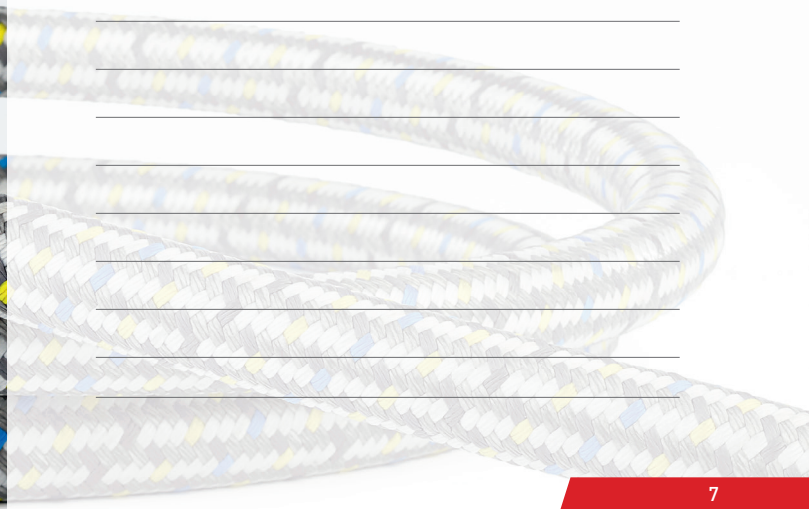
2. Can a steel wire rope be replaced by soLITE® in an existing lifting facility or is there any conversion work required?

It has to be checked on a case-by-case basis if soLITE® is compatible with the employed winch. There is no intention to convert from steel wire ropes to soLITE® as a retrofit. To be able to utilize the full increase in load capacity, further components would have to be exchanged and the control system adapted. For customers to benefit from the full load capacity increase, Liebherr has therefore developed crane types that are optimized for soLITE®.



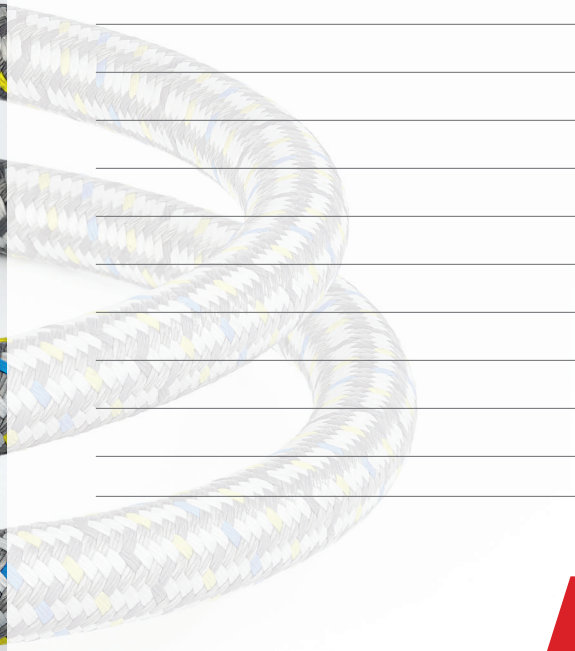
3. What about the spooling behavior as well as wear and tear in multi-layer spooling systems compared to a conventional steel wire rope?

In case of the grooving-system 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 laid design of soLITE® - which features all the characteristics of a steel wire rope that are crucial for a high spooling quality. Due to the special construction, the wear and tear of soLITE® in a multi-layer spooling system is considerably lower than that of a steel wire rope. More than a 10 times higher life time can be achieved this way.



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

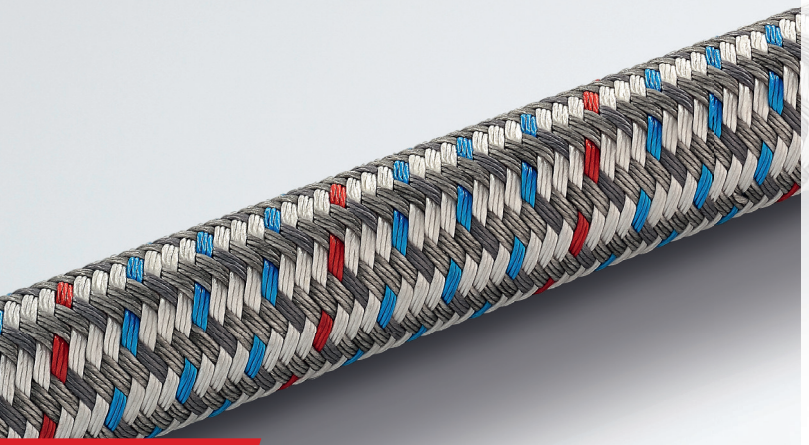
Just like every other rope, soLITE® elongates when operated under load. The elasticity of soLITE® is approx. 20 - 30% higher than that of comparable steel wire ropes. Thus, soLITE® provides for a softer and more precise response during loading/unloading compared to a high performance wire rope.

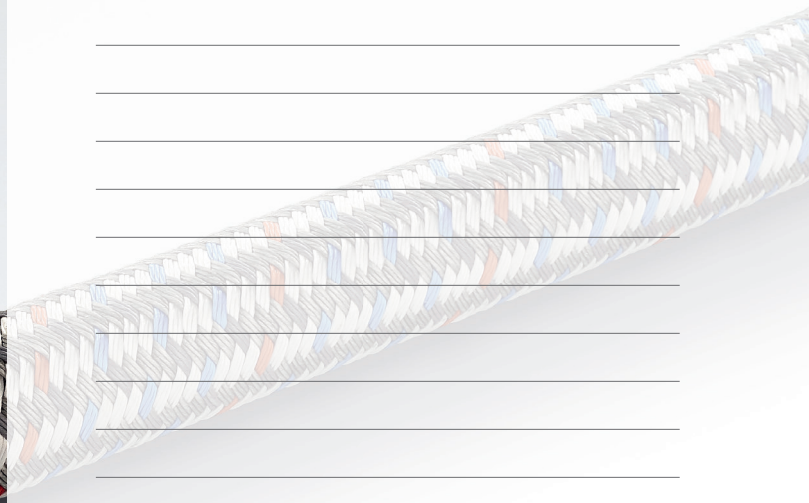


5. What about the cost-benefit ratio of soLITE® compared to that of a customary high-performance steel wire rope?

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

- 80% less rope weight, thus allowing a lighter hook block and therefore 10% more load capacity than with a steel wire rope
- Environmentally friendly - no lubricants
- No wear of sheaves and drums
- Significantly longer service life
- Higher crane availability
- Easy and safe determination of the point of discard



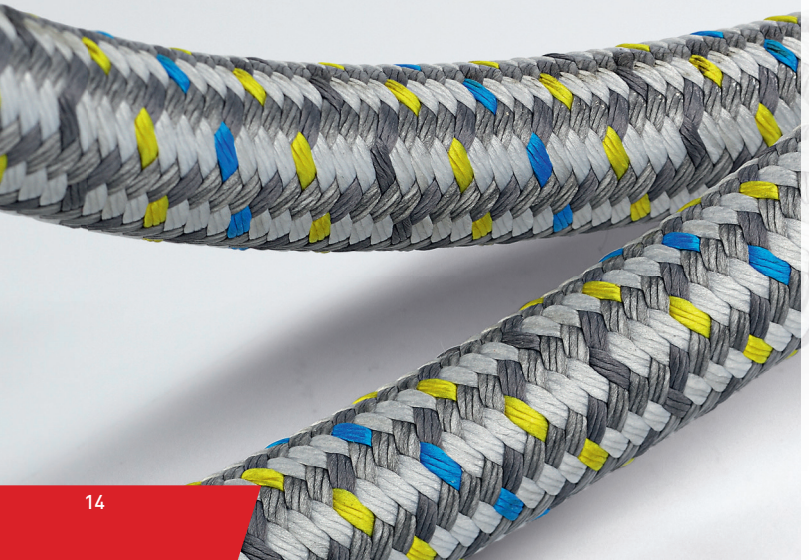


6. Can the service life of soLITE® be compared to that of a conventional high-performance steel wire rope?

On a tower crane, a service life of 7 years can be achieved in normal construction site operation, this means four times the service life of a steel wire rope. In other rope applications, the attainable service life may be even longer. In realistic trials with multi-layer spooling, a service life of at least ten times longer than that of a steel wire rope has been achieved on a steady basis.

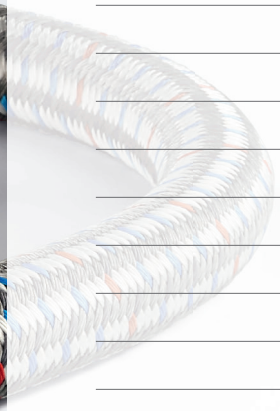
7. What about the influence of chemicals or environmental conditions (rain, saltwater, UV, sand, dust, ...) on the properties of soLITE®?

The load-bearing fibers of the rope 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 as 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.



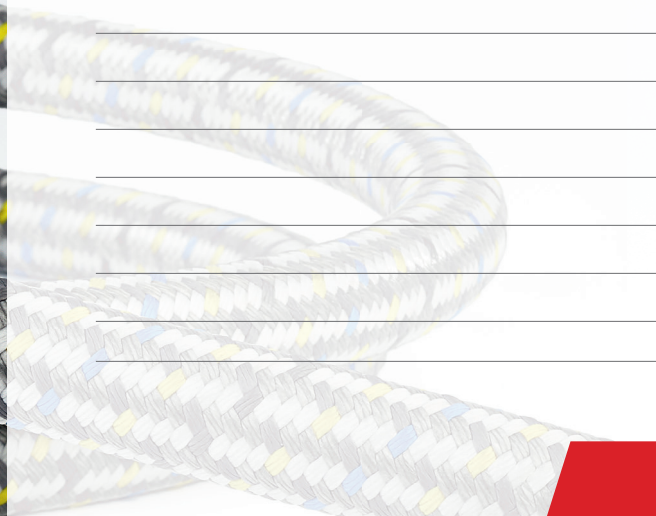
8. If soLITE® gets damaged, can it be repaired?

Generally, it is possible to repair the cover, provided that the load-bearing core has remained undamaged. Whether or not such repair is possible and sensible must be assessed by an expert case by case.



9. Does the rope need maintenance?

soLITE® does not require any lubrication or other maintenance. Regular visual inspection - also necessary in case of steel wire ropes - and thorough cleaning of the rope when heavily soiled will be important for reaching the maximum service life.

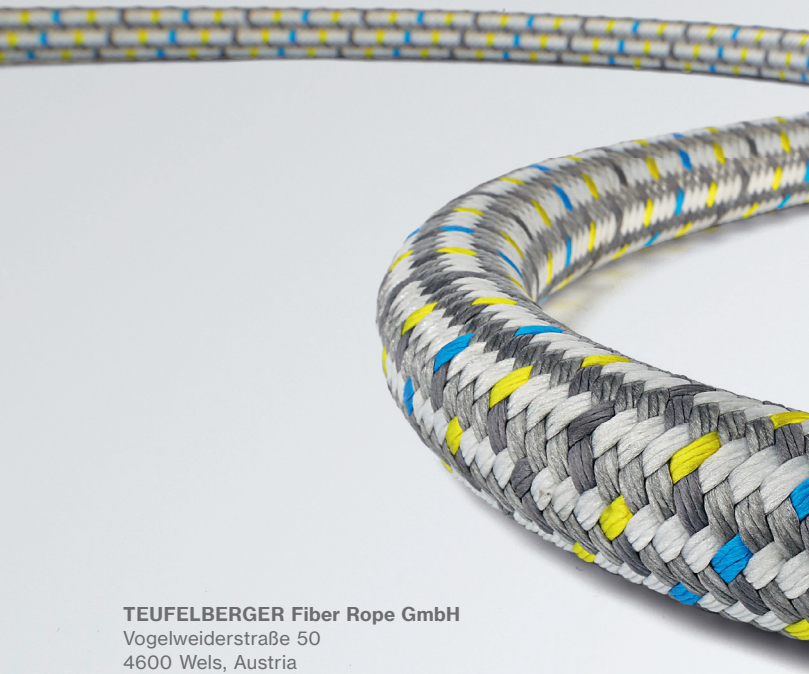


10. How does soLITE® respond to different (extreme) temperatures?

The temperature range currently defined for the use of soLITE® is -40°C to +50°C.

Stressed by permanent bending cycles, fibers are wearing quicker at high temperatures than at low ones. Methods to determine the point of discard of the rope are working well within the allowed temperature rage. The tensile strength of soLITE® does not depend on temperature.

Generally, fiber ropes should be kept away from all heat sources (flying sparks, exhaust pipes, fire, etc.). Ice and snow will not affect the breaking force and service life, but the rope will become stiffer at low temperatures and ice. If the rope constantly chafes over ice and snow, the condition of the rope has to be inspected at shorter regular intervals.



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