

Bending Fatigue

Why do CASAR Special Wire Ropes attain the longest service lives?

Conventional rope designs often do not meet the requirements of modern reeving systems. Shorter service lives result.

CASAR Special Wire Ropes offer various design advantages which lead to longer service lives.

- A larger number of strands increases the number of contact areas within the rope and on sheaves and drums.

- Parallel lay prevents the crossover of strands and improves the contact conditions within the rope.

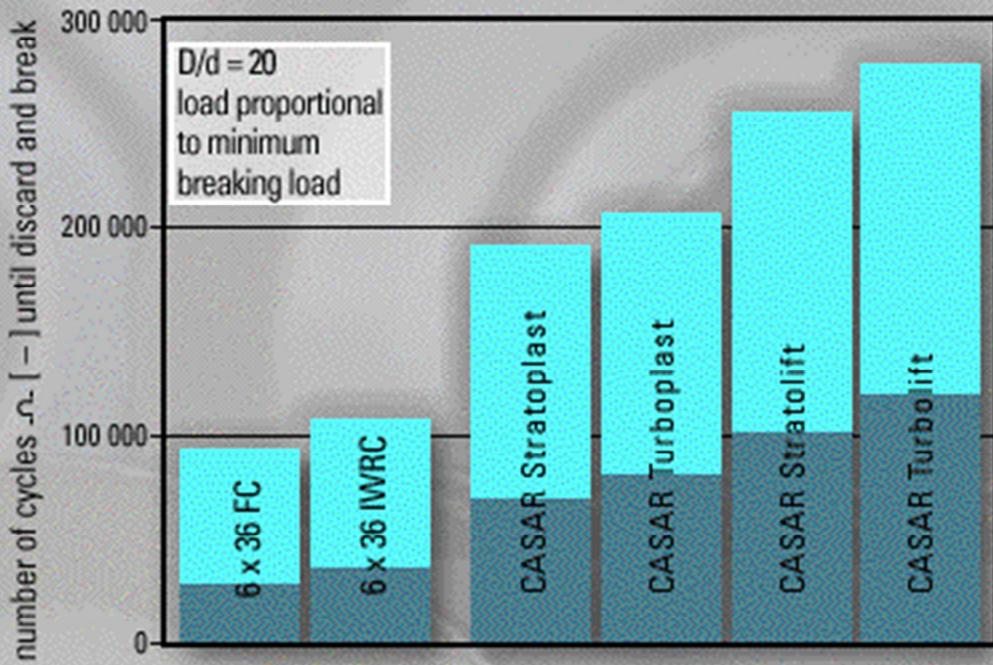
- A plastic layer reduces the danger of structural damage and internal wire breaks.

- Compaction of the strands improves the contact conditions within the rope and on sheaves and drums.

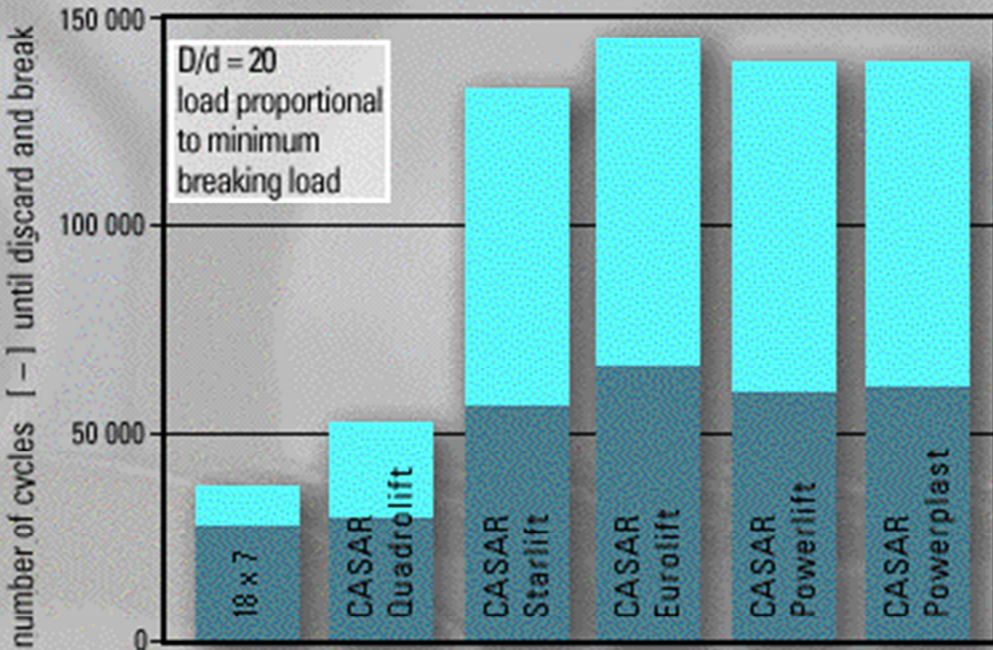
- A large number of strands with smooth surfaces increases the flexibility of the rope.

The long service lives of CASAR Special Wire Ropes offer the user the following practical advantages:

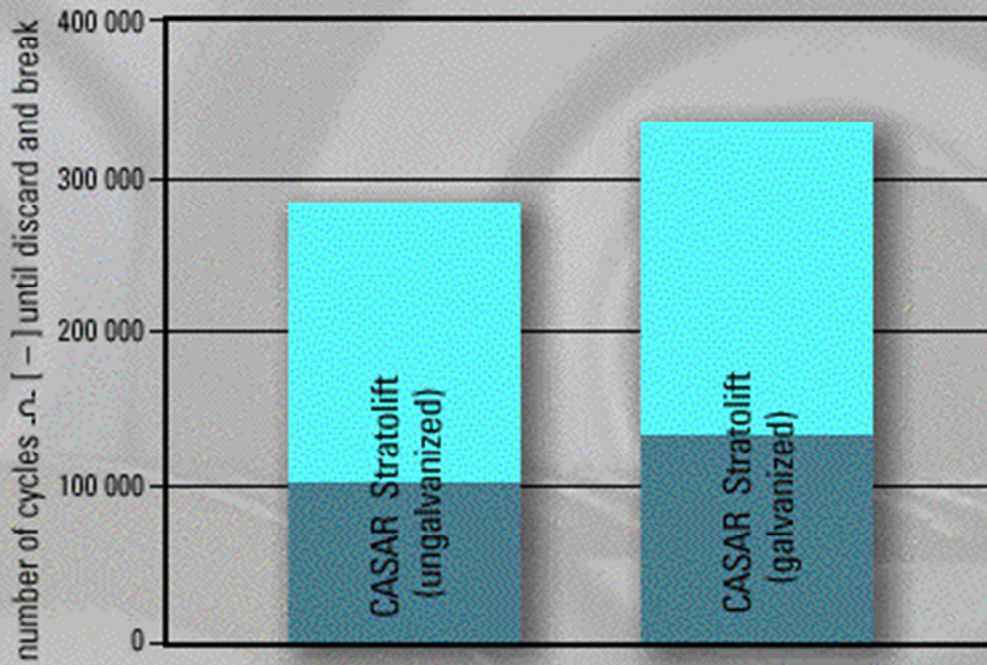
- Reduced downtime due to fewer rope changes.
- Reduced costs for rope changes.
- Minimized rope costs.
- Optimum price/performance ratio.



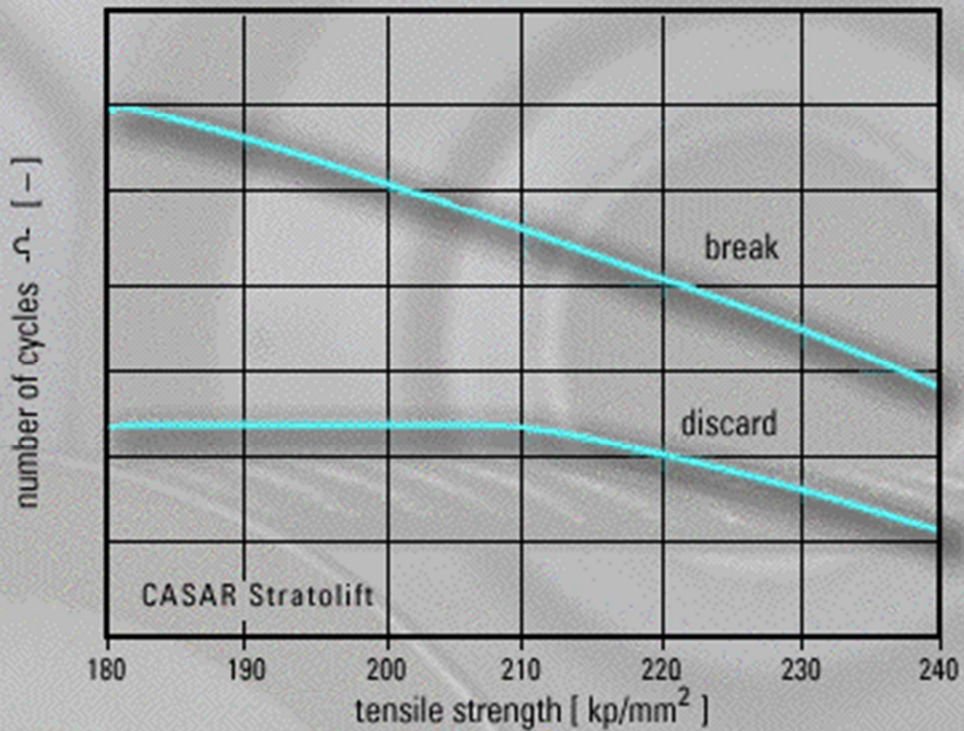
Bending fatigue 1: Comparison of numbers of cycles until discard and break for non rotation-resistant ropes. Under the same test conditions, CASAR Special Wire Ropes achieve much higher numbers of cycles than conventional ropes.



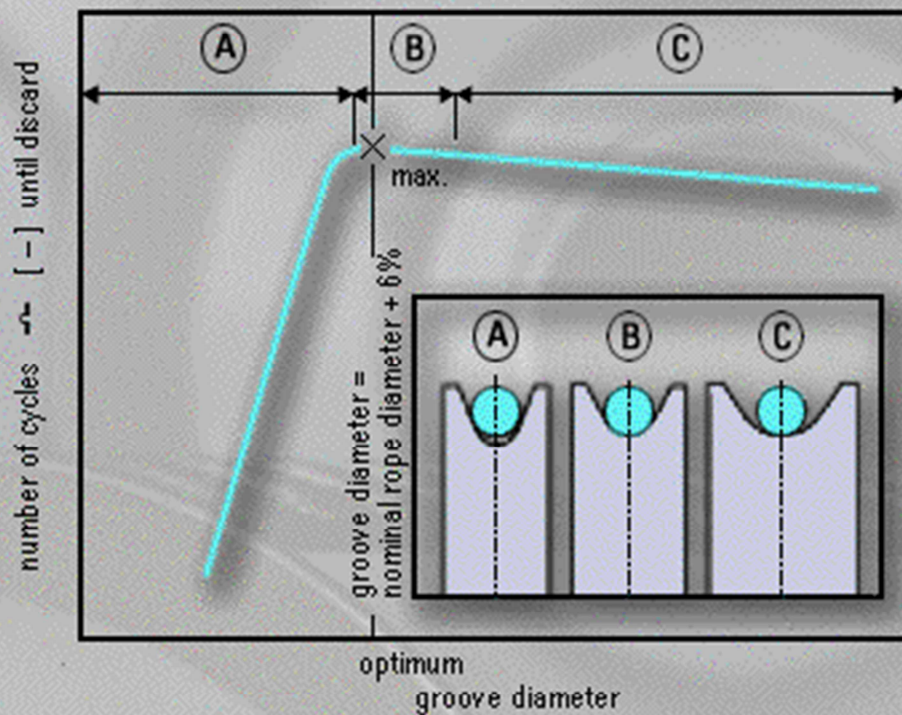
Bending fatigue 2: Comparison of numbers of cycles for rotation-resistant ropes. Under the same test conditions, CASAR Special Wire Ropes achieve much higher numbers of cycles than conventional ropes.



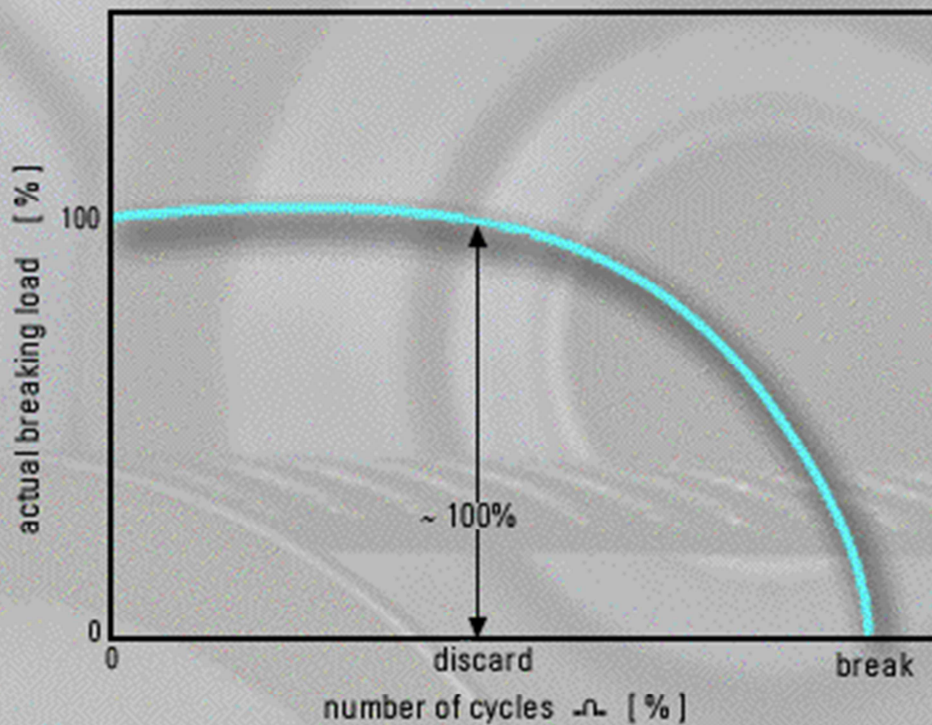
Bending fatigue 3: Comparison of numbers of cycles until discard and break for ungalvanized and galvanized ropes, in both cases lubricated. Under the same test conditions, the galvanized rope achieves higher numbers of cycles.



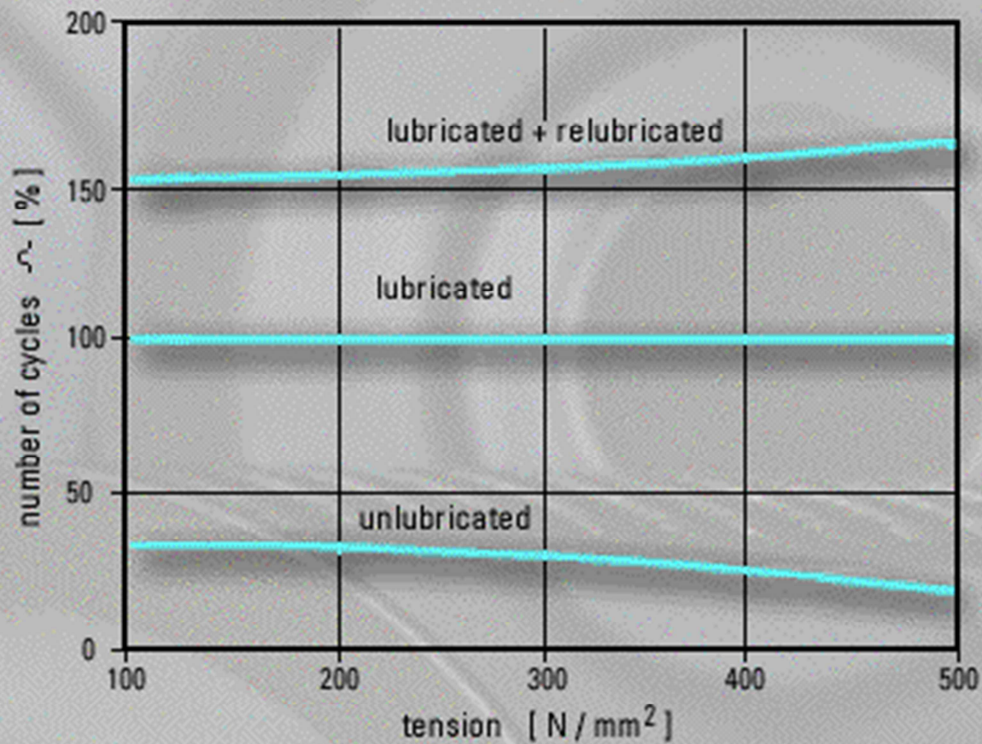
Bending fatigue 4: Comparison of numbers of cycles until discard and break for ropes of different tensile strength under constant load.



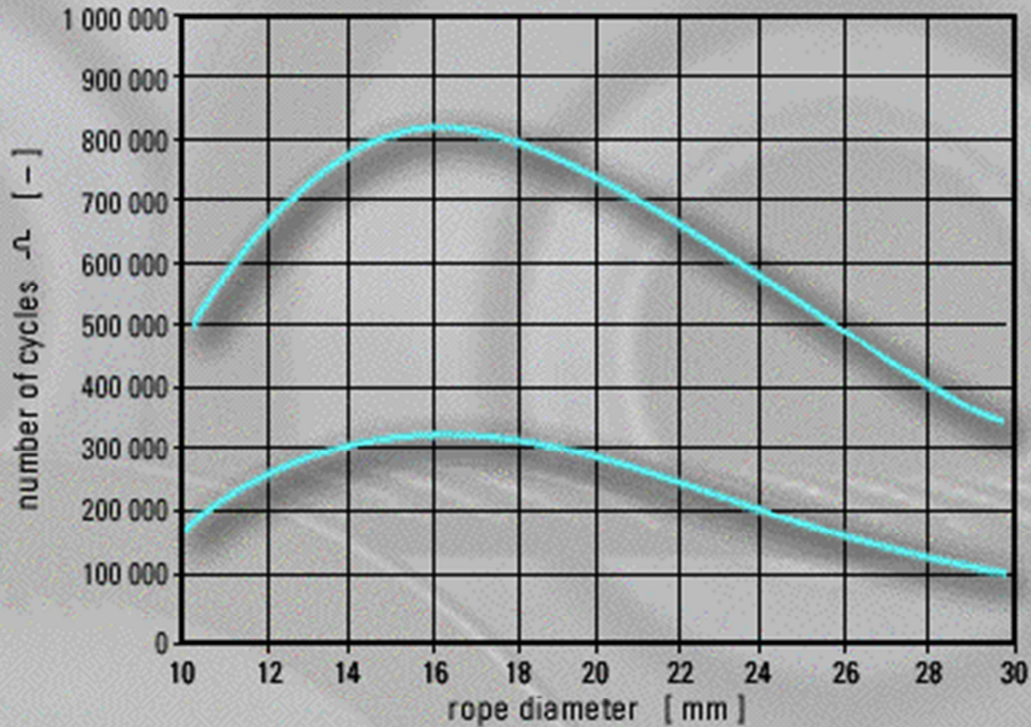
Bending fatigue 5: Rope life as a function of the groove diameter of the sheaves. The optimal groove diameter is nominal rope diameter plus 6% (B). For larger groove diameters, the service life decreases steadily (C), for smaller groove diameters it decreases rapidly (A).



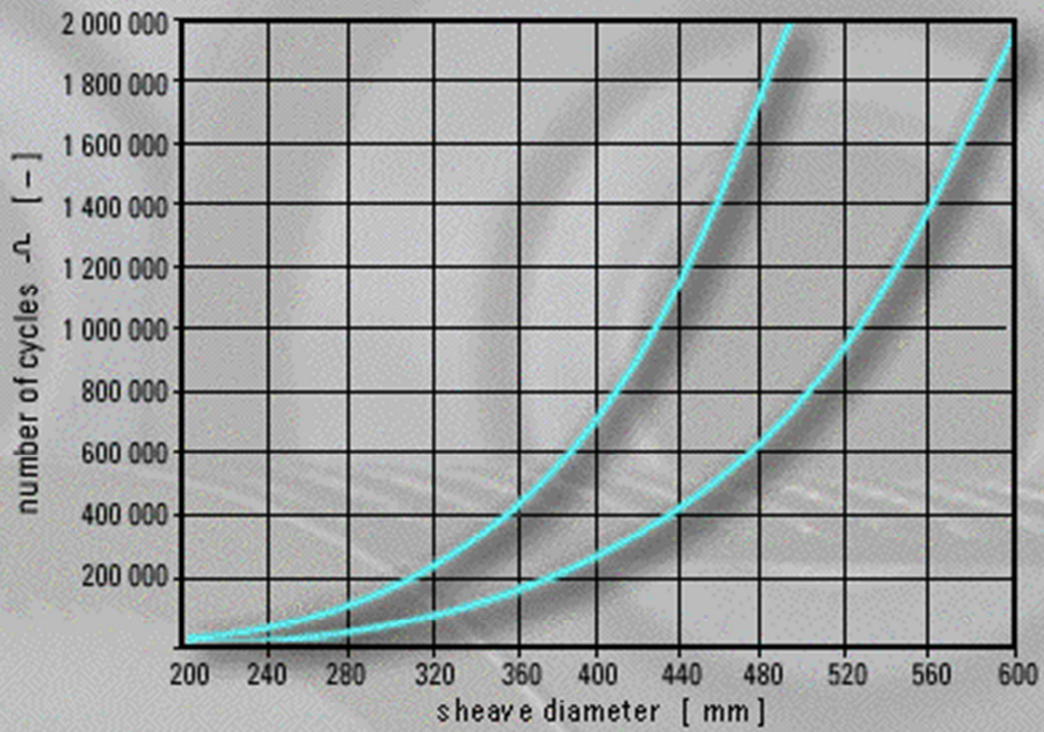
Bending fatigue 6: Breaking load of running steel wire ropes depending on the number of cycles. Normally, the actual breaking load increases during the first half of the service life. When the discard criterion is reached, the rope can still achieve its minimum breaking load.



Bending fatigue 7: Number of cycles until discard for unlubricated, lubricated (= 100%) and relubricated steel wire ropes. Relubrication during service life considerably increases, lack of lubrication reduces the service life drastically.



Bending fatigue 8: Number of cycles until discard (lower curve) and break (upper curve) depending on the nominal rope diameter. For every combination of sheave diameter and line pull there is an optimum rope diameter.



Bending fatigue 9: Number of cycles until discard (lower curve) and break (upper curve) depending on the sheave diameter. The service life of a wire rope increases with increasing sheave diameter.