

WHAT HAPPENS IF ... my rope gets abraded?

One of the main questions in the rope world is “Is my rope still good to work with?” Manufacturers specify a theoretical service life in their instructions for use. This is mainly based on very rare use. The actual service life, especially when the rope is heavily used, depends on a lot of factors that are beyond control of manufacturers. In this series, TEUFELBERGER presents the results of a study made on “Deliberate damage of ropes”. In this paper, we want answer some frequent questions on the abrasion and share the results about the topic of “Abrasion resistance” with you.

Abrasion resistance testing of PES and PA ropes

In this test series pure Polyamide or Polyester ropes, which are mainly used for Rope Access and Tree Care were tested. The test samples have been pulled rotating over a ceramic edge (Corundum) for **200 cycles**. The constant load on the rope was 10 kg. The number of cycles were independent from rope diameter or rope weight. After these cycle tests, the ropes have been tested for their breaking residual strength.

The following rope samples have been tested:

- Patron 11 white-red (Polyamide) – EN 1891 A rope
- Platinum® Protect PA 10,5mm (Polyamide) – EN 1891 A rope
- Sirius Accessory Cord 10mm (Polyester) – Accessory cord, not EN-certified

The pictures below show the looks of the rope samples after 200 abrasion cycles. It is visible that the degree of abrasion on the cover differs between the samples. However, the results of the residual break load testing (see next page) show a different picture. This means that not only the cover is damaged, but also the load bearing core got damaged although the abrasion mechanism only acts on the outside of the rope.



Pic.1: Patron 11mm white-red

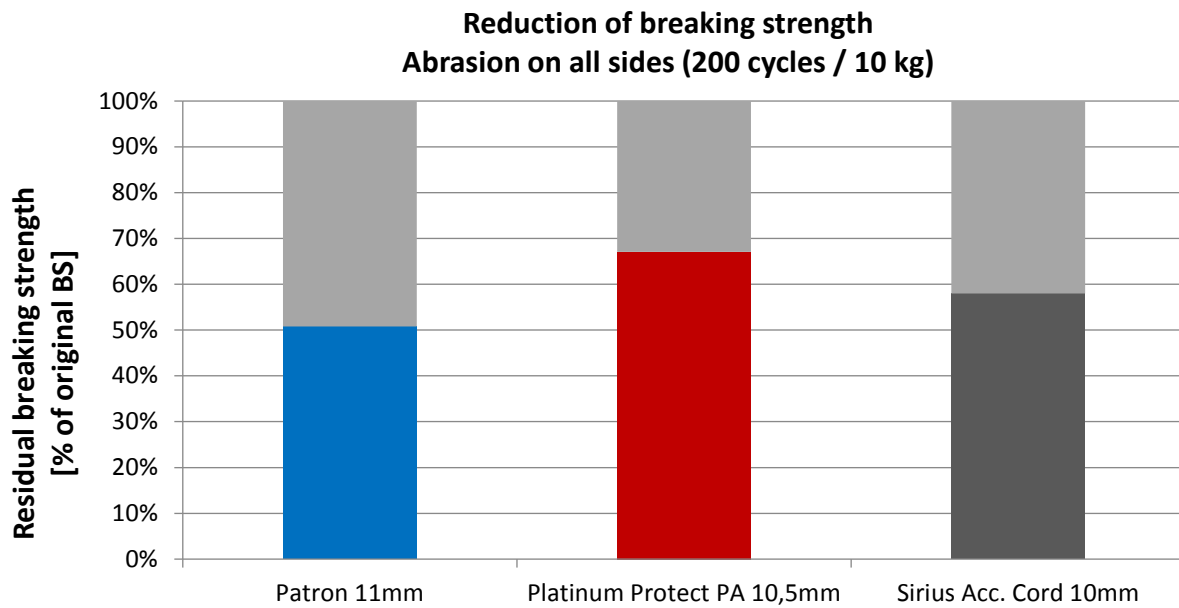
ABRASION RESISTANCE



Pic.2: Platinum® Protect PA 10,5mm blue-white-red



Pic. 3: Sirius Accessory Cord 10mm black-green



It is interesting to see that Platinum® Protect PA 10,5mm shows better results than Patron 11mm. This is probably due to the fact that Platinum® ropes with its interwoven cores and the connection between core and cover result in a better distribution of load and thus an increased abrasion resistance.

CONCLUSION & RECOMMENDATION

- The abrasion resistance of a rope is dependent on its construction.
- Coatings and/or innovative technologies forms the best foundation for a more abrasion-resistant rope.
- The results show that there is no way for the user to determine the discard criteria only by visual control
- Attention! The damage situation may look similar on different ropes, but their residual strength may be vastly different
- If there exists only the slightest doubt regarding the safety, the rope must be replaced!