

### WHAT HAPPENS IF ... I disinfect my rope?

One of the main questions in the rope world is “Is my rope still good to work with?” 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 disinfecting ropes and share the results about the topic of “Disinfection Resistance” with you.

In early 2020, the Coronavirus situation surprised the world. We got a lot of questions concerning "disinfection of ropes" during that time. That's why we published two studies (from 2015 and 2020) about the influence of disinfectants on the breaking strength of ropes.

#### 1. Disinfection tests on fibers

As a first step, the influence of ethyl alcohol (Ethanol) and Isopropyl on the raw material was tested.

The following materials have been tested:

- Polyamide fiber white
- Polyamide fiber colored
- Polyamide sewing thread
- Polyester fiber white
- Polyester fiber colored
- Polyester sewing thread
- Polyester webbings
- Aramid (Twaron®)
- Vectran
- Dyneema®

Therefore different yarns have each been submerged into the disinfectants for 3 minutes. Then they have been dried naturally for at least 48 hours before they have been tested for their residual strength.

#### **No abnormality has been detected!**

The reduction of breaking strength was insignificant.

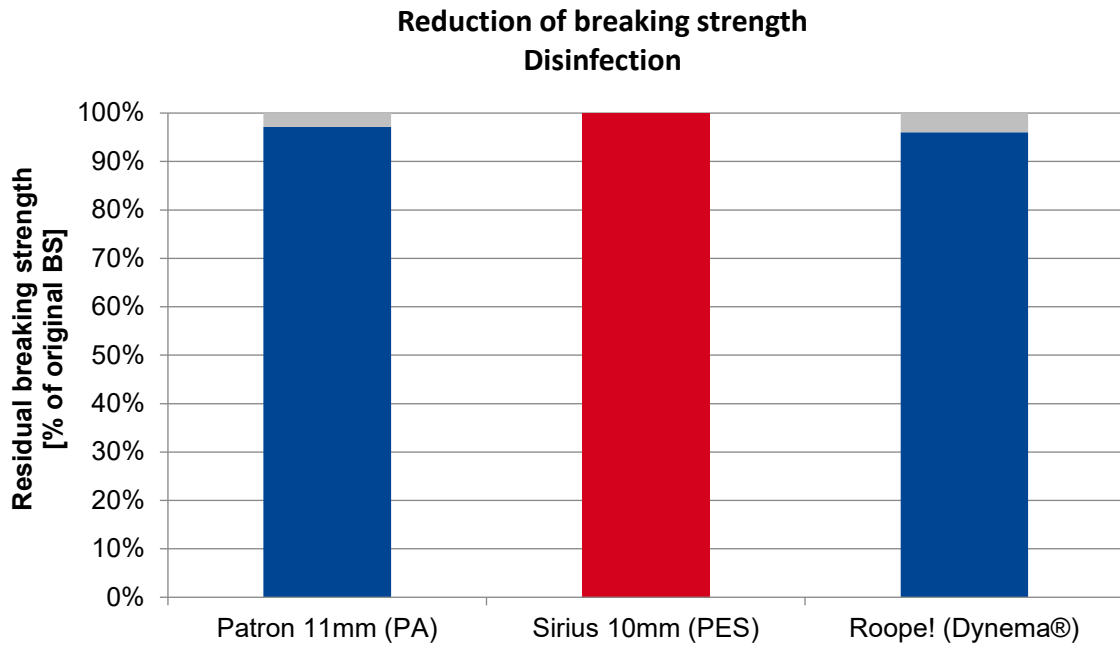


# DISINFECTION OF ROPES

## 2. One time disinfection of ropes

In 2015, we at Teufelberger conducted a study about “Deliberate Damage of Ropes”. In this study, we tested the impact of different kinds of soiling, washing and abrasion on the rope’s breaking strength. In the arborist business, for example, it is a normal course of business to disinfect the equipment after working in pest-infested regions. Therefore, as a part of the study, the impact of disinfection was also tested.

In the study we tested ropes made of different materials (Nylon, Polyester, Dyneema®). The ropes were disinfected one time by being submerged in a solution of 70% Isopropanol and 30% distilled water for 3 minutes and then left to air dry naturally for 48 hours before being tested for their residual strength.



The results show, that there has been no decrease in breaking strength for Polyester ropes, and only 2-4% decrease for other ropes tested. However, we did note that the hand and flexibility of the rope does deteriorate after the disinfection.

## 3. Multiple disinfection of ropes

Later in the year, in the interest of customer safety and as a result of new Covid-19 regulations, climbing gyms around the world were forced to disinfect ropes, holds and equipment at a far more frequent rate, some even after each climber. Gym owners began questioning the impact of all that disinfection on the performance of the ropes. Many of them reached out to us directly for the answer and we did some more tests.

The tests were carried out using a dynamic climbing rope MAXIM Chalkline 9.7 mm made of polyamide.

### Test procedure

- 1. Simulation of climbing**  
Ten climb/lower simulations were performed by pulling the rope through a belay device (Petzl GriGri) bi-directionally
- 2. Disinfection of climbing rope**  
Rope samples were sprayed completely with Isopropyl 70% (distance approx. 30cm) and wiped down with a damp cotton cloth (also with Isopropyl 70%) after each simulation
- 3. Drying the rope**  
Rope sample was left to dry naturally for 30 minutes, then the simulation was repeated.

The tests were performed 6 times in one day for one sample and 18 times within 3 days for another sample.

## CONCLUSION & RECOMMENDATIONS

The results of the study showed, that there is **no significant difference** in the breaking strength (and impact force at first fall, dynamic elongation, total falls on dynamic ropes). Only the handling and flexibility of the rope may change due to disinfection.

Based on these results, from a manufacturer's point of view it is acceptable to disinfect a rope one time or multiple times following the instructions below:

- Ropes can be disinfected by either immersing them in a solution of 70% isopropanol and 30% distilled water for a maximum of 3 minutes, or by spraying or wiping them with a solution of 70% isopropanol and 30% distilled water.
- Air dry the ropes naturally away from heat source or direct sunlight
- The Safety rules provided on the safety data sheet should be followed for all other rope care. A qualified inspection of the rope is mandatory.
- Disinfection should be done when needed and not daily - the long term impact is being tested.
- This Data applies to the disinfection of the ropes themselves and does not make any recommendations as to any other procedures or policies for preventing infection in other areas.