

The Impact of Controlled Conditioning on Prusik Loop Strength

Prusik loops are an integral component in most technical rescue systems used by Wilderness SAR teams. They are used throughout the systems from simple extensions to “fail safe” belays. During field use, these simple – yet key life safety – cord loops are commonly exposed to harsh environmental conditioning. All too often, after the rescue, these prusik loops are readily incorporated back into the rescue gear with little thought.

It is well known that wet rope loses as much as 30% of its strength, yet little is known about the impact of the repeated conditioning on the prusik material that is nearly universal throughout technical rescue.

This study was designed to examine the impact environmental conditioning on 8 mm cord. Prusik loops were wetted in either water alone or in a water-soil mixture. The prusik loops were then further conditioned by 5 cycles of slow pulls (1000 pounds) and relaxation, the timing of which was designed to mimic the hauls in a technical rescue system. The prusik loops were air dried and stored at room temperature until the next cycling session. Prusik loops were exposed to 1, 2, 5, and 8 cycles. Treated prusik loops were then tested to failure under controlled parameters.

The data from this study is presented in its entirety and used to offer the Rescue Community guidance regarding a replacement schedule of prusik materials as well as soft goods in general.

About the Presenters

A. Lee Lang is a member of Larimer County Search and Rescue, a Rocky Mountain Region MRA accredited team. Lee is also a member of the Board of Directors for NASAR as well as the SAR Editor for Technical Rescue, an international journal focused on the technical issues in SAR, which has subscribers in over 15 countries around the world. Lee has also served as an instructor for the National Park Service's EHART course, the technical rescue training for NPS Rangers in the eastern half of the United States. Lee's experience also includes presentations at NASAR and SARCON as well as articles in Technical Rescue regarding various topics in SAR. Lee has also been an avid rock climber for more than 20 years and his climbing experience includes various big walls in Zion, Yosemite and Mexico.

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Dick Borowski is a member and the President of Larimer County Search and Rescue, a Rocky Mountain Region MRA accredited team. Dick is a retired air force officer as well as a retired test pilot. Dick's career includes working for major aerospace engineering firms as a project manager.

Michael Vincent Onorato is a senior studying Mechanical Engineering at Colorado State University. As a lifelong Alaskan, he has become familiar with wilderness safety in both winter and summer months. He has both given and received aid in the mountains, and knows firsthand how important safety practices are. Along with his skiing and climbing experience, he has performed research and testing in biomaterials and polymers.