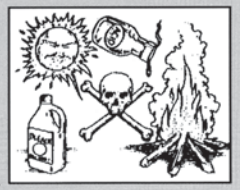
USE AND CARE OF ROPES

Always protect your rope at potential abrasion points. Most ropes are retired because they become frayed, not because of the number of falls held. Watch for sharp edges like rock crystals, bolt hangers, glass, and even pack grommets, which can cut a rope's sheath. Retire your rope if you can see the core at an abraded area or if the rope feels lumpy or flat in spots.

Keep your rope clean. Dirt shortens rope life by causing internal as well as external abrasion. Transport and store your rope in a protective bag or pack. Wash a dirty rope in cold water using mild, non detergent soap. Adding fabric softener while washing improves rope flexibility by lubricating the fibers. **Do not bleach your rope. Air dry your rope away from direct sunlight. Do not dry it in a dryer.**

Store your rope away from heat, sunlight and chemicals. Protect your rope from all compounds containing acids, alkalis and oxidizing agents. Avoid contact with battery acid and bleach. Avoid contact with petroleum substances such as gasoline and oil which do not appreciably affect nylon ropes by themselves but may contain additives that can cause damage. These substances also attract dirt which causes the rope to wear more quickly.



Always use proper rappelling techniques. Fast rappels, bounding, or swinging can damage your rope. Some rappel devices place a sharp bend in the rope which creates excessive heat build up and stresses the rope's fibers, leading to accelerated wear.

Never use a climbing rope for any purpose other than for what it was intended. It is not for towing cars, trimming trees, working on roof, etc.

No!

Never step on a rope. Stepping on a rope grinds dirt into the rope fibers, causing excessive wear.

THE CLIMBER'S CREDO

Climbing and mountaineering activities which include technical rock, snow, and ice climbing, back country skiing, and general mountaineering, combine many unique opportunities and choices to experience individual freedom and self-determination in our natural environment. An essential element of this expression of freedom through climbing and mountaineering is the acceptance of the many risks and dangers that are inherent in and integral to these activities.

The exercise of good judgment and common sense can help reduce the risks. The proper use of climbing equipment can also help reduce these risks. However, such risks and dangers cannot be totally eliminated, even with the proper use of climbing equipment. By the purchase and use of climbing equipment and your participation in climbing and mountaineering activities, you are personally accepting full responsibility for all of the inherent risks of these activities, including without limitation the risk of injury or death.

We recommend that you take the time to learn the proper use and limitations of each individual piece of climbing equipment. Obtain personal instruction from a qualified person well versed in the appropriate techniques that may help reduce the risks of these activities.

Retailer's Stamp

CLIMB SMART!

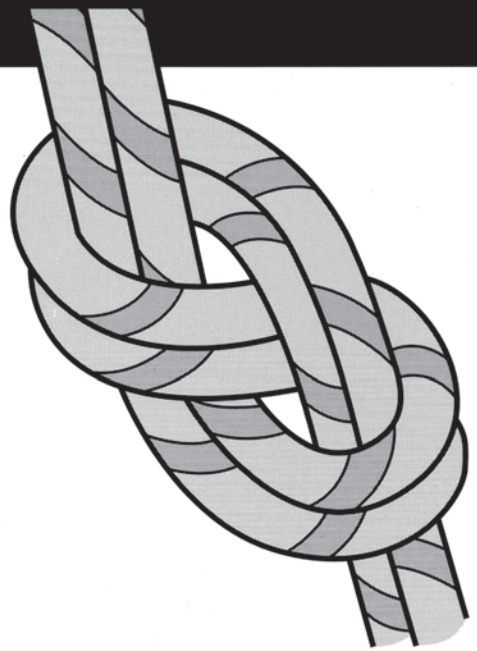
—REMEMBER—
YOUR SAFETY IS YOUR RESPONSIBILITY.

CLIMBING SPORTS GROUP ORCA

Climb Smart! is a public information program of the Climbing Sports Group, the trade association of the climbing industry (303) 444-3353.

Ropes

Information for consumers on the design, use, maintenance and limitations of ropes.



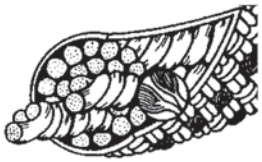
CLIMB SMART!

Climb Smart! is a public information program of the Climbing Sports Group, the trade association of the climbing industry.

A CLIMBING ROPE is the indispensable lifeline for the climber and therefore must absolutely not fail. An understanding of the design and construction of climbing ropes, as well as knowledge of their selection, use, and care, is crucial to reducing the risks associated with climbing.

ROPE DESIGN & CONSTRUCTION

All ropes used for lead climbing should be dynamic. They are designed to stretch when fallen on, absorbing shock and dissipating the energy generated by the fall. Static ropes, such as those made for caving and rescue work, are designed with minimal stretch. Although static and dynamic ropes look the same, they are not interchangeable. Static ropes should never be used for lead climbing or any application where dynamic loading may occur.



Cross section of a kernmantle rope showing the weave of the core and the sheath.

Climbing ropes utilize a kernmantle construction consisting of a core (kern) covered by a sheath (mantle). The core is the main load-bearing element and largely determines a rope's characteristics, such as static elongation, maximum impact force, and strength. The sheath is braided tightly around the core and its primary purpose is to protect the core against abrasion, but the relationship between the core and sheath also helps determine a rope's handling characteristics.

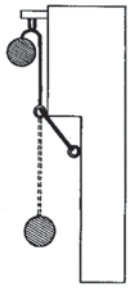
Knots, bends, rock edges, and falls all reduce rope strength. For example, running the rope over a carabiner with a diameter of 10 millimeters will reduce the rope's strength by approximately 30%. Smaller diameter carabiners or rock edges reduce the strength even further.

WARNING: SHARP EDGES ARE EXTREMELY DANGEROUS AND ARE THE MAIN CAUSE OF ROPE FAILURE.

Static elongation is the stretch of a rope when weighted with an 80 kg/176 pound load. A low static elongation is desirable for rappelling, ascending, and hauling. Maximum impact force is the maximum load transmitted to the climber during a fall. The current standard specifies a maximum impact force of 12kN/2640 pounds of force for single ropes and 8kN/1760 pounds for double ropes.

A rope with a low maximum impact force absorbs more of the energy generated in a fall than a rope with a high maximum impact force, thus transmitting less energy to the protection system and the climber. However, low impact force translates to more rope stretch, which may increase the chances of hitting the ground.

Historically, the UIAA (Union International des Associations d'Alpinisme) was the international body that certified climbing ropes. The CEN (Committee for European Normalization) now coordinates standards that are upheld throughout the European Community. The CEN adopted the UIAA rope standards, and ropes tested to CEN/UIAA standards now carry the CE mark. The US government does not require ropes to carry a CE or a UIAA label, nor does it recognize the CE standards. Therefore, standards are presently being developed through the ASTM (American Society for Testing and Materials).



An 80 kg/176 lb. weight drops a distance of 4.8 m/15.75 ft. in the CE/UIAA test. The rope is statically anchored and must survive five consecutive falls for single-rope certification.

The CE testing procedure consists of dropping an 80kg/176-pound weight attached to an 2.6m/8.25-foot length of rope a distance of 4.8m/15.75 feet. This test yields a very severe fall which would be difficult to duplicate in an actual climbing situation. It is important to note that ropes lose elasticity, so their ability to absorb energy diminishes when subjected to repeated falls over a short period of time.

While the CE/UIAA has set standards for these tests, all of the results are pass/fail. A CE/UIAA label indicates that the rope has passed the minimum tests only. Any other information listed on the rope label is at the manufacturer's discretion. Number of falls, impact force, etc. are all based on the manufacturer's claims, which may be based on theoretical estimation, and not necessarily on test results.

ROPE ATTRIBUTES

Flexibility. If a rope is too stiff, knots are difficult to tie and may even untie themselves. If a rope is too loose, this can allow knots to tighten so much when loaded that they cannot be untied.

Water absorption. Water absorption greatly increases the weight of the rope, reduces its strength, and reduces its ability to absorb impact forces. In cold weather, absorbed water freezes, making the rope stiff and unmanageable (ice crystals also reduce rope strength). Many nylon ropes are treated with a water-repellent coating to help prevent moisture absorption. "Dry" ropes will not saturate immediately when subjected to moisture; therefore, they will remain lighter and stronger than untreated ropes. However, "dry" treatments do not stop water absorption, and treatments wear off over time with rope use. Ropes with tightly woven sheaths absorb water slower than ropes with loosely woven sheaths.

Abrasion resistance. Abrasion resistance is the rope's ability to resist fraying. Weave patterns, flexibility, and treatments all affect a rope's abrasion resistance.

Kinking. Every rope kinks. Help prevent kinking by properly uncoiling the rope from the manufacturer's coil. Place your arms inside the main coil. Spin your arms, allowing the rope to un-wind. Do not pull the rope; let it unravel as your arms rotate. Further kinking problems are generally due to improper coiling techniques (i.e. loop coils), and rappel devices (i.e. fig. 8's and Munter hitches).

Hand. "Hand" describes how a rope feels and handles. Diameter, weave pattern, coatings/treatments, sheath tightness, sheath material, and production quality all help determine a rope's hand.

ROPE SELECTION

First, determine whether a dynamic or static rope is best for your intended use. ***Always use a dynamic rope for lead climbing.*** Static ropes may be used for rappelling, rescuing, caving, top roping, and hauling where there is no chance of significant impact loading.

Typically, climbing ropes sold in the United States carry a CE mark and a tag stating rope diameter, length, manufacturer's statement on number of falls held, maximum impact force, weight per meter, and classification of rope (single, double, etc.).

Single ropes are the most common and are identified by the number "1" inside a circle on the label at either end of the rope. Single ropes vary in diameter from 9.8 to 11 millimeters. Thick ropes last longer and usually hold more falls. Small diameter ropes are lighter and easier to clip into protection, making them the preferred choice for high-end lead climbing and glacier travel.

Double ropes (or half ropes) are used only in pairs. These ropes range from 8.2 to 9 millimeters in diameter and are identified by a number "1/2" within a circle on the label at the end of the rope. Double ropes may be clipped alternately through the protection, reducing rope drag and decreasing the chances of rope failure over an edge.

Twin ropes are a third classification offered by some manufacturers and are certified by the UIAA. These are delineated by a "∞" symbol on the UIAA label. Both of the twin ropes are clipped through every protection point. The strands should never be separated. Twin ropes are uncommon in the United States. **Double and twin ropes are designed to be used with a matching rope.** Use of unmatched ropes will cause undue wear on one of the ropes, usually the one with the lowest working elongation or greatest diameter.

Bi-colored ropes change colors or sheath patterns at the midpoint. This feature allows you to easily find the center of the rope.

INSPECTION OF ROPES

Inspect your rope before and after each use. It is the user's responsibility to know the history of the rope and to determine when it should be retired; keep a rope log on how many times it has been used and the number of falls held. When in doubt, retire your rope. Generally, a rope should be discarded after holding a long hard fall, if it has flat or soft spots, becomes stiff, or shows sheath damage.

Retire a rope after no more than four years of occasional use, two years of weekend climbing, or one year of active use. Retiring a rope after only six months of hard use isn't uncommon; some climbing gym ropes wear out after only a few weeks of intensive use. Also, multiple short lead falls (common in sport climbing), bounding rappels, and shock-loaded top rope falls can have a cumulative negative effect on the rope's shock-absorbing capacity.