



## Climbing Equipment

### Carabiners

Carabiners are lightweight, metal snap-links used by climbers for a wide variety of climbing tasks. They come in a range of styles, sizes and designs. To choose and use them properly, you must first understand the differences between them.

Carabiners are built to connect things together such as a climber to a rope, a rope to a piece of protection or a collection of protection pieces to a climbing harness. They're strong, because they have to be able to withstand extreme forces (and because lives often depend on them). They're light so that climbers carry a bunch of them without getting weighted down.



**Locking Type** - Locking 'biners are the only type approved for use by Boy Scouts. They have gates that can be locked in the closed position to provide extra protection against accidental gate-openings. They should be used anytime you depend on a single carabiner for safety, such as top roping, rappeling, while belaying, or at your first piece of protection.

Locking 'biners can be oval, D-shaped or asymmetrical. The locking devices themselves range from simple threaded collars that screw down over the gate to spring-loaded, "automatic" mechanisms.

### Strength

Carabiners are designed to be loaded along their long ("major") axis with their gates closed. When loaded correctly, all of carabiners carries are built strong enough to handle the loads found in normal climbing situations.

Unfortunately, carabiners can fail at loads well below their rated strength when they're used incorrectly or if they're loaded with their gates open.

### Weight

In general, the less weight you carry with you as you climb, the better. But lighter carabiners are not always better than heavier ones. Super-light carabiners often use narrower rod stock, which can result in lower gate-open strengths and shorter life

spans. Narrow 'biners can also cause more rope wear, since the narrow ends can act like edges, biting into your weighted rope as it slides past.

## **Size**

Carabiners also come in a variety of sizes. Large 'biners are typically easier to handle, easier to clip (they have larger gate openings) and can hold more gear inside. They are commonly used with belay and rapel devices. Smaller 'biners are lighter and take up less room on your rack.

### **Get a Feel for Your Options**

Once you've narrowed down your search to a handful of carabiner styles, grab a few examples and get a feel for how they fit in your hand, how easy they are to clip and unclip, and how smoothly the gates work. Try locking and unlocking the gate a few times (with one hand). Choose models that feel good, operate smoothly and are easy to work with.

### **Safety Tip: Inspecting Your Carabiners for Damage**

- Check all surfaces of your carabiners for cracks, sharp edges, corrosion, burrs or excessive wear. Even hairline cracks can reduce 'biner strength by more than 50%.
- Check each gate to make sure it opens and closes quickly and easily. Be sure all gates (and any locking mechanisms) close freely and completely.
- Make sure no rivets are bent or missing.

If any of your carabiners don't pass the above inspection, remove them from service and destroy them. Also retire any carabiner that has been dropped a significant distance (over 20 feet), especially if its gate ceases to function properly. Dropped 'biners can suffer significant damage yet still appear intact. If you are unsure about the condition of any 'biner that has been dropped, consult a climbing expert for advice before using it again.

### **Safety Tip: Basic 'Biner Care**

To get the most out of your carabiners, keep them clean and free of grit. If you notice a sticky gate, wash it in warm, soapy water, rinse it thoroughly and lubricate it with dry graphite, WD40 or a similar lubricant around the hinge area, the spring hole and the locking mechanism. Be sure to wipe off all excess lubricant. Don't store your 'biners in humid or salty air, with damp equipment or clothing, or near corrosive chemicals. Don't file your carabiners for any reason, however you may sand down burrs with 220-400 grade sandpaper. If this doesn't remove the burr, destroy the 'biner.



Black Diamond Keylock Mini Pearabiner

A slim profile and lightweight material make this Mini Pearabiner easy to operate while rappeling or belaying.



Petzl William Screwgate Locking Carabiner

The large size of this pear-shaped Petzl® William locking carabiner is well-suited for belaying and anchoring needs.



DMM Big Boa HMS Locksafe Carabiner

This Big Boa opens its jaws wide to handle big loads of webbing, ropes and pro.

## CLIMBING: HARDWARE: BELAY AND RAPPEL DEVICES

### Figure 8

These are shaped like the number eight, as the name implies, with one larger and one smaller hole. A bight (bend) of rope is fed through the large hole and looped around the outside of the small hole till it rests on the "neck" of the figure 8. The small hole is clipped to the climber or anchor. Figure 8's are frequently used for search and rescue, caving, and traditional climbing as rappel devices. As belay devices, they are limited to top-roped situations.

**Advantages:** Figure 8s are very efficient and smooth for rappelling, dissipate heat efficiently and can be used with just about any rope diameter.

**Drawbacks:** As belay devices, figure 8's offer inadequate braking for anything but top-roping (unless used like a belay plate with rope going only through the small hole). They also require more attention and more force from the belayer's hand than other devices, and they put a twist in the climbing rope, which can make rope handling difficult.

**Examples:** The Black Diamond Super 8 and the Hugh Banner Hard Anodized Figure 8 are figure 8's that can be used for belaying as well as rappelling.



Black Diamond Super 8 Belay Device

Designed with belaying in mind, the Super 8's versatile dual-hole design allows use with single or double ropes.

### How to Choose a Climbing Helmet

You know that wearing a helmet is using your head. Now to find one you can live with! The most important things to think about are where you climb most often and what your comfort requirements are. Consider the following:

- **Fit**—If you've ever worn a bike helmet you know that fit is essential. Any helmet, (including one for climbing), needs to cover your head and stay in place. Too tight or too large and it will become a nuisance, one you may end up leaving at home or in the car.
- **Adjustability**—Most climbing helmets are offered in one size that can be adjusted to fit. If you'll be sharing the helmet with anyone or wearing a hat on colder days, you want the helmet to adjust quickly and easily. The Petzl Ecrin Roc, for example, features an adjustment wheel that can be moved while the helmet is on your head.
- **Feel**—If possible, try on helmets at your local REI. Make sure you put the helmet on straight down on top of the crown of your head. The front brim should be straight across the forehead. Tilting the helmet backwards, although jaunty-looking, leaves your forehead unprotected from rock fall.
- **Ventilation**—Think about where you will be using the helmet. If you climb in typically hot areas, will it be cool enough? Look for a helmet with a generous number of air vents.
- **Layering**—For colder climates or alpine climbs, think about warmth. Will a hat fit comfortably underneath? A balaclava, typically thinner than a hat, makes a good layering piece underneath a helmet.
- **Alpine climbing**—If you spend your time on all-day alpine climbs with pre-dawn starts, look for a helmet with clips or straps for attaching your headlamp. The Edelrid Ultralight and Black Diamond Half Dome are 2 helmets with this feature.

- **Sport climbing**—If you typically spend your time at the sport crags, you may want to try a lightweight helmet, such as the polystyrene-lined Petzl Meteor.

### **Accept No Substitutes!**

Only rock climbing helmets will be allowed for rock climbing since they meet standards set by the CEN (European Committee for Standardization) and UIAA (Union Internationale des Associations d'Alpinisme). The helmets are tested for shock and energy absorption, conical impact, security of retention straps and for ventilation. The CEN assures that these products go through quality-control testing as well.

**Retirement** Helmets have a limited life span. They should be retired

- if they have been dented, cracked or damaged in any way, including the straps
- after a serious impact, even if they don't show outward signs of damage

After five years, mainly because UV radiation from sunlight weakens the materials



Black Diamond Half Dome Helmet - With its simple lines, great ventilation and easy-adjust suspension system, the Half Dome is likely to change the minds of reluctant helmet-wearers.



Black Diamond Tracer Climbing Helmet - It's so lightweight and unobtrusive, you'll hardly notice the Black Diamond® Tracer helmet, but you'll appreciate its protection in a fall.



Black Diamond Tracer Climbing Helmet – Kids -

The Black Diamond® Tracer helmet for pint-size climbers offers all the protection of an adult-size helmet but adds fun-to-wear graphics.

## How to Choose the Right Climbing Harness

Harness links you to your climbing rope, it should fit your body shape for comfort and safety, and be designed to meet the needs of your climbing style. Construction varies among these categories to meet your specific needs.

### Consider Your Climbing Style

- **Multi-Purpose**—These are also known as all-around, crag or sport harnesses. Ideal for beginners, they are designed to function well in a number of climbing applications such as top-roping, sport and gym climbing. Most have padded leg loops and waistbelts for maximum comfort when working a route or taking a fall. Detachable leg loops let you answer calls of nature without untying from the rope. Most models also feature convenient gear racking loops for easy access to hardware or your chalk bag without the need for a shoulder sling. These harnesses typically feature a dedicated front loop so you can easily attach a belay/rappel device.

### Compare Types of Harnesses

- **Leg Loop/Waist belt** - This popular style of harness consists of a padded waist (or "swami") belt and a pair of leg loops joined together in front with a belay loop. The waist belt buckles in front or off to the side, and the leg loops are typically held up in back with elastic straps. These straps are often detachable for ease of changing clothes or answering calls of nature. Leg loop size may either be fixed or adjustable. Some manufacturers sell swami belts and leg loops separately to offer a truly customized fit.

NOTE: For safety and comfort reasons, never attempt to climb in just the waist belt or the leg loops by themselves.

- **Diaper** - Diaper-style harnesses are normally constructed of flat webbing that wraps around your waist and legs. It consists of a buckled waist belt with adjustable leg loops sewn to it. This design allows you to adjust the fit for varying thicknesses of clothing. Some diaper-harness leg loops can be released while the waist belt remains tied to the rope, making clothing changes and calls of nature safer. These harnesses typically do not have a separate belay loop.
- **Full Body** - Full-body harnesses are designed for children or adults with narrow waists and hips. The harness holds shoulders as well as legs, preventing you from slipping out should you rotate upside down during a fall. Since full-body harnesses have a higher tie-in point than seat harnesses, they reduce the chance of flipping over backward in the first place. Despite this, many climbers prefer separate seat and chest harnesses for their comfort and versatility.

- **Chest** - Chest harness are typically worn only on climbs where you could likely turn upside-down. Falling into a crevasse during a glacier climb or rappelling with a heavy pack are examples of such situations. The chest harness is really a component part. It must be worn in conjunction with a seat harness. The resulting combination is the same as the full-body harness, but with the versatility of adding or removing the chest portion, as needed.
- **Women's Cut** - These models can take into account the proportionally smaller waists and larger leg sizes of many women. The rise (or distance between the leg loops and waist belt) is longer than that on men's or unisex harnesses. This category allows many women and climbers with special fit needs to find a comfortable, safe harness.

### Check for Fit

Finding a harness that fits you well is essential. Too tight, and it will restrict your movement and/or pinch. Too loose and it will slip, chafe and, in an inverted fall, maybe even let go of you. Just like clothing, different harness brands fit different body shapes better than others. Be sure to find one that works well for you.

Whenever you test-fit a harness, make sure you're wearing the kinds of clothes you're likely to be climbing in. If you plan on carrying a pack with you as you climb, have it handy as well so you can make sure it doesn't cause any discomfort when worn in conjunction with the harness.

**The Waist belt** - Your harness waist belt should be snug, but not uncomfortably so. It should ride just above your hipbones, but it should not interfere with your breathing. You should not be able to pull the harness down over your hips, no matter how hard you try. Children and narrow-hipped adults—if you can't get a harness to stay above your hip bones, use a full-body harness until your body shape works with a waist belt-style harness. Be sure that there is at least 3 inches of webbing extending out of the waist belt buckle once it has been properly secured and doubled back.

**Leg Loops**—Your harness leg loops should also be snug, but not uncomfortable. If they are an adjustable design, their webbing straps should be long enough for you to double them back through their buckles with at least 2 inches left over.

Be especially careful when fitting a seat harness. If you choose one that's too small, it will squeeze your hips and legs, reducing mobility. If you choose one that's too large, the harness may slide up onto your lower ribs, compressing your diaphragm and leaving you gasping for air. You should have between 1 and 3 inches of clearance between the tie-in loops at your waist.

### Buckling up and tying-in

Most harnesses use full-strength buckles to join the waist belt. Read the manufacturer's instructions carefully and learn how to use your harness and the buckle

correctly. If your harness and buckle are not secured properly, you risk injury and possibly even death.

Most harness buckles must be buckled a specific way to be secure. Be sure you follow the recommended procedure every time. **ALWAYS** double back all webbing straps through your harness buckles. Under the impact force of a fall, webbing straps that are not doubled-back can pull through buckles, causing you to fall out of the harness altogether.

Remember that your harness is only as reliable as the knot you use to tie yourself into it. Make sure you know how to tie into your harness correctly. Read, understand and follow the manufacturer's instructions that come with the harness. Be careful—different styles have different tie-in procedures. It is your responsibility to know how to use your harness correctly, along with all of your other climbing gear.

### **Harness Care**

Protect your harness from direct sunlight, heat and harsh chemicals like bleach. Wash your harness in cool water with mild, non-detergent soap. Always check your harness before you climb for frayed stitching, cuts or other forms of damage.

Remember that your harness will not last forever. If you climb every weekend, your harness should last a couple of years. The harder you climb and the more often you fall, the weaker your harness will become. Replace your harness whenever it shows signs of wear or damage.



Black Diamond Alpine Bod Harness - Alpine Bod is designed for climbers who want just the essentials in a harness at a minimal price.



Black Diamond Bod Harness - This all-purpose harness is lightweight and streamlined for alpine routes, yet padded enough for sport climbing.



Black Diamond Chaos Harness - Black Diamond®'s Chaos harness brings order in the form of comfort over miles of rock. Plush design is welcome relief on multi-pitch routes.



### **Black Diamond New Momentum AL Harness Package**

This handy starter kit instantly outfits new climbers with the basics without breaking the bank.

## **How to Choose the Right Climbing Rope**

### **Make a Few Basic Decisions**

**Single vs. Double Ropes** - Single ropes are designed to be a climber's sole connection to their protection system. They're best suited for straight-up routes with little zig zagging. Single ropes are lighter than 2 double ropes used together, and they're the most common choice for climbing in the US. Single ropes are identified by the number "1" inside a circle on the label at either end of the rope. They vary in diameter from 9.8 to 11 millimeters.

**Dry vs. Non-dry Ropes** - When a rope absorbs water, it becomes heavier and less able to absorb the forces generated in a fall. In cold conditions, absorbed water can freeze, making a rope stiff and unmanageable (ice crystals can also reduce rope strength). "Dry" ropes are treated with water-repellent coatings to reduce water absorption. They won't saturate as quickly as "non-dry" ropes when exposed to water, so they remain stronger and lighter. Keep in mind that "dry" treatments do not stop water absorption completely, and that treatments wear off over time as a result of normal rope use.

**Low Elongation vs. Dynamic Ropes** - All ropes used for lead climbing must be dynamic. Dynamic ropes stretch when fallen on, absorbing shock and dissipating the energy generated by the fall. Low-elongation ropes provide minimal stretch. They're typically used for activities like caving, rappelling and hauling where there is no chance of significant impact loading. Low-elongation ropes can be used for top-rope climbing, as long as you make sure that no slack builds up between the climber and the belayer.

### **Consider the Basic Variables**

- **Diameter** - In general, the thicker a rope's diameter, the stronger it will be and the longer it will last (all other factors being equal). Smaller diameter ropes are lighter and easier to clip into protection, however, making them more popular for high-end lead climbing and glacier travel. REI and Adventure 16 carry dynamic single ropes in 10mm, 10.5mm and 11mm diameters.
- **Length** - You can travel farther on each pitch (and each rappel) with a longer rope. But shorter ropes will weigh less and take up less space in your gear bag. REI and Adventure 16 sell ropes that are 50m, 55m and 60m long.

- **Strength** - Climbing ropes are typically rated for both "static elongation" and "maximum impact force". Static elongation refers to the amount a rope stretches when weighted with a standard weight load (80kg/176lbs). Maximum impact force refers to the amount of force transmitted to a climber during a fall.

A low elongation rating means that a rope will not stretch much (which can be useful in aid climbing), while a higher rating means the rope stretches more (which will cushion the impact of a fall on a climber's body).

A rope with a low maximum impact force absorbs more of the energy generated in a fall over a longer period of time, transmitting less to the climber and the protection system. However, that low impact force will result in more rope stretch, which increases your chances of hitting the ground or a rock ledge during a fall.

- **Construction** - Climbing ropes have kernmantle constructions; a tough, inner core (kern) covered by an outer sheath (mantle). The core is the main load-bearing element of the rope. The sheath is braided tightly around the outside of the core to protect it against abrasion.

Different ropes have different sheath weaves, which can affect their durability and the "hand" or feel of the rope (for more details on your options, consult an REI salesperson). Some ropes have weave pattern changes at their mid-points to make it easier for climbers to find the middle (which is convenient when rappelling).

- **Flexibility** - A rope's flexibility affects how easy it is to handle and how easy it is to tie in knots. Some climbers prefer more flexible ropes, because they're easier to tie, but when loaded, those knots can become difficult to untie. Others prefer stiffer ropes because they're easier to thread through different climbing gear pieces and because knots tied in them are easier to get out. Flexibility is largely a matter of personal preference.

### **Rope Care and Safety**

- **Keep your rope clean** - Dirt particles are extremely abrasive to ropes. Keep your rope off the ground at all times, and flake it out on a tarp when climbing. Avoid stepping on your rope, since doing so can drive dirt particles deeper into the rope surface. Be especially careful around your rope when wearing crampons.
- **Care for your rope correctly** - Wash your rope in cold water with a mild, non-detergent soap. Rinse thoroughly and air dry. Never bleach or machine dry your rope. Store it loosely in a rope bag when you're not using it, away from heat, sunlight and harsh chemicals.
- **Use your rope correctly** - Climbing ropes are designed for climbing only. Don't use one for anything else (like roofing, tree-trimming or towing a car).

- **Use proper rappelling techniques** -- Forget movie-style rappels. High-speed, smokin' rappels damage your rope sheath, and bounding rappels create extremely high loads on your anchors and rope.
- **Check your gear carefully** -- Before and after every climb, check your rope for signs of abrasion and/or sheath damage. While you're at it, check the rest of your climbing gear as well for signs of wear. Retire anything that shows damage.

## Rope retirement

The useful life of your climbing rope will depend on how often and how hard you use it. Ropes are not cheap, but neither is your life. Follow these basic retirement guidelines even if your rope shows no visible signs of wear:

- **Occasional use** (every other weekend or so) -- replace after 4 years.
- **Weekend Climbing** -- Replace after 2 years.
- **Sport Climbing** -- The repeated short falls typically encountered when working sport climbing routes can be very hard on a rope. Replace every few months to every half year. Many climbing gyms replace ropes every few weeks.
- **Hard Falls** -- Replace your rope after ANY hard fall. Also replace it if it has flat or soft spots, becomes stiff or shows sheath damage.
- **In Doubt?** -- If you're not sure, replace it!

HINT: Keep a climbing diary or log book to help you track your rope usage time.



BlueWater 1" Tubular Webbing - Climb-Spec - Use this tubular webbing for making your own runners or entries, for anchoring or for use as a sling.



Blue Water 2-Inch Climb-Spec Tubular Webbing - This super-strong double-thickness webbing is used for slings or tie-ins. This super-strong double-thickness webbing is used for slings or tie-ins.

- Tubular climb-spec construction--higher thread count than regular webbing plus double-lock stitch closure reduce abrading and prevent unraveling

Cord and webbing are sold by the foot, when ordering, please indicate the number of feet you would like in the "quantity" box. Made in USA.



Edelweiss Axis 10.3mm x 60m Dry Rope - Nesting between classic 10.5 mm and lightweight ropes, Edelweiss® Axis offers easy handling and flexibility, great for sport and indoor routes.



Edelweiss Sharp 10.5 mm x 60m Dry Rope - Edelweiss incorporates their best rope-building technology into this rope.



BlueWater Lightning Pro 9.7mm x 60m Non-Dry Rope - Ideal for sport or extreme alpine climbing, the low-bulk lightweight performance of this rope makes it easy to handle, clip and carry.



BlueWater Slimline Elite 10.3mm x 60m Non-Dry Rope - Free yourself from some bulk and shave a little weight while you're at it, the BlueWater® Slimline Elite™ is an all-around workhorse.



Mammut Eiger 10.5mm x 60m Non-Dry Rope - Mammut® ropes have safeguarded generations of climbers--and this one is an ideal workhorse for a day at the crags.