

# Carabiners

A *carabiner* or *karabiner* is a specialized type of shackle, a metal loop with a spring-loaded gate<sup>[1]</sup> used to quickly and reversibly connect components, most notably in safety-critical systems. The word is a shortened form of *Karabinerhaken* (or also short *Karabiner*), a German phrase for a "spring hook" used by a carbinerifleman, or carabinier, to attach items to a belt or bandolier.

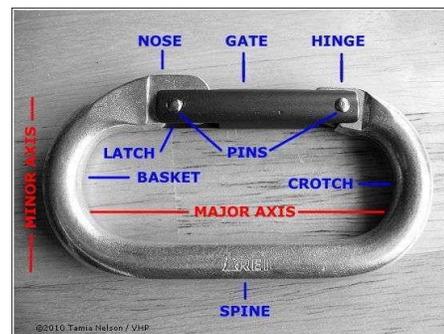
Different climbing tasks require different kinds of carabiners. To choose and use them properly, you must first understand the differences between them. There are three main areas to consider:

- Shape
- Gate type
- Size, weight and strength rating

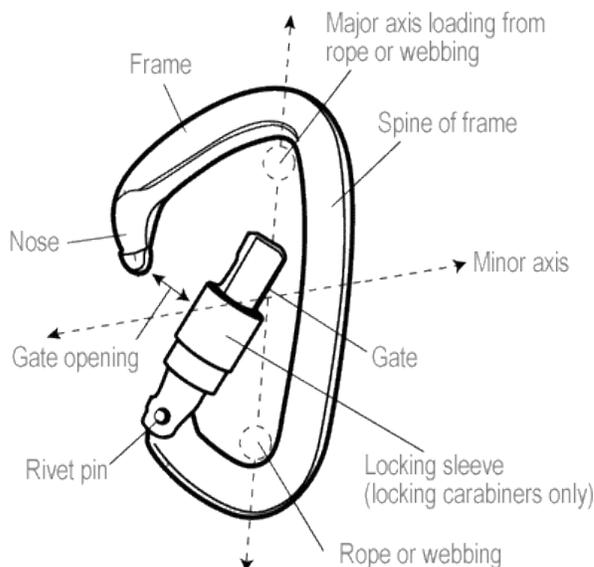
Once you understand the differences, think about your needs - What type of climbing you do and how you'll use the carabiner will determine what carabiner you need.

## Carabiner Parts

### Classic Oval Design



### Modern Carabiner Parts



Climbing carabiners have a spring built into the hinge rivet pin that automatically closes the gate allowing for one-handed operation.

The nose sometimes has a notch for the gate to engage though most now don't.

Locking gates have a sleeve (sometimes called a barrel due to their shape) that either screws up to lock the gate, is spring loaded or a combination of both. A few have magnetic locks.

# Carabiner Shapes

## Asymmetric D Shape

By far the most popular design out there, asymmetric D carabiners (sometimes called offset D or modified D carabiners) work like regular D's, but they're slightly smaller at one end to further reduce weight. Asymmetric 'biners generally have larger gate openings than regular Ds, which makes clipping them even easier. But they don't have as much inside room as similarly sized Ds or ovals. Asymmetrical carabiners make up the vast majority of the carabiners that most climbers use today.

**Pros:**

- Large gate opening
- Strong and light

**Cons:**

- More expensive than other shapes
- Not as strong as the D shape



## Pear Shape

Similar to the asymmetric D shape, pear-shaped carabiners have large gate openings to allow easy clipping of ropes, knots and gear. Pear-shaped carabiners are used primarily for belaying and rappelling, but also can be used at anchor points for top roping or multipitch climbing. You'll sometimes hear these called HMS carabiners, and some are even marked with HMS on the spine. HMS indicates that the carabiner is designed with a wide, more symmetrical top that works well with a Mütner hitch.

**Pros:**

- Large gate opening
- Designed specifically for belaying and rappelling

**Cons:**

- Heavier and more expensive than most other shapes
- Not as strong as D and asymmetric D shapes



## D Shape

D-shaped 'biners are excellent for most kinds of climbing. They hold loads off-center toward the stronger, non-gated spine, so a smaller, lighter D carabiner can be just as strong as a larger oval.

**Pros:**

- Strongest shape
- Larger gate opening than oval shape

**Cons:**

- Smaller gate opening and heavier than asymmetric D shape
- More expensive than oval shape



## Oval

Oval carabiners are the original style. They're versatile and affordable, though not quite as strong as other shapes. Oval 'biners have smooth, uniform top and bottom curves to limit load shifting. They offer more gear-holding capacity than D-shape 'biners and their symmetry permits them to be used for carabiner-brake rappels.

They're ideal for aid climbing because they center loads at their curve; runners won't shift under load.

### Pros:

- Uniform shape limits load shifting
- Hold more gear than D-shape carabiners

### Cons:

- Smaller gate opening and heavier than other shapes
- Not as strong as other shapes



## Carabiner Gate Types



Straight



Bent



Wiregate



Locking

## Straight Gate Carabiners

Standard straight gates are strong, durable and easy to use. They are very common and are used for a variety of purposes. Carabiners with straight gates are found on quickdraws and are frequently used for racking gear, such as cams and stoppers. As the name implies, they're perfectly straight from pivot point to end. Like most other types, they're spring-loaded to open easily when pushed, but close automatically when released.

Some straight-gate carabiners are also **keylock carabiners**. A keylock carabiner has a smooth notch where the nose of the carabiner and the gate interact. This keeps the carabiner from hooking and catching on your harness gear loop, bolt hangers and other slings, any of which can be quite annoying. You'll likely pay a little extra for this feature, but it's a nice upgrade.

### Pros:

- Durable and easy to use
- Can feature a keylock nose for snag-free clipping

### Cons:

- Heavier than wiregate

## Bent Gate

These strong, durable gates have a concave shape that makes clipping a rope quick and easy; they are generally reserved for the rope-end of quickdraws.

Like straight-gate carabiners, some bent-gate carabiners are also **keylock carabiners**.

Bent-gate carabiners typically have an asymmetric shape.

### Pros:

- Make clipping the rope easy
- Durable
- Can feature a keylock for snag-free clipping

### Cons:

- Heavier than wiregate

## Wiregate Carabiners

Wiregate 'biners use a loop of stainless steel wire for a gate, which decreases overall weight and eliminates the need for extra parts found in conventional gates. Wiregate designs also allow for larger gate openings. They are less likely to freeze up than other gate styles in cold, wet weather. Although wiregates don't appear as strong as conventional styles, most are. Also, due to the lower mass in the gate itself, wiregates are less likely to vibrate open during a fall. (This is called gate lash. For more about gate lash, see below.)

### Pros:

- Lightweight
- Help reduce gate lash
- Less likely to freeze shut

### Cons:

- Can be less durable than solid straight and bent gates

## Locking Gate Carabiners

Locking carabiners have gates that can be locked in the closed position to provide extra protection against accidental gate openings. They feature either a manual (a.k.a. screw-lock) or auto-locking system.

**Screw-lock** gates require the user to manually screw the sleeve onto the gate to lock it.

**Auto-lock** carabiners automatically lock whenever the gate is closed.

Locking carabiners, though heavier than non-locking models, are the only choice for use with a belay/rappel device. You should also consider using them at belay stations and at critical protection placements. They offer a more secure attachment and enhance your peace of mind.

### Pros:

- Locking gate adds security

### Cons:

- Heavier than other styles

# Carabiner Size, Weight and Strength

## Carabiner Size

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

**Gate open clearance**, provided in millimeters, is something you may want to pay attention to when looking at the size of a carabiner. This number refers to the width that the gate can open, plus the depth and shape of the bottom of the carabiner below the gate. Generally the smaller the carabiner, the less clearance it offers.

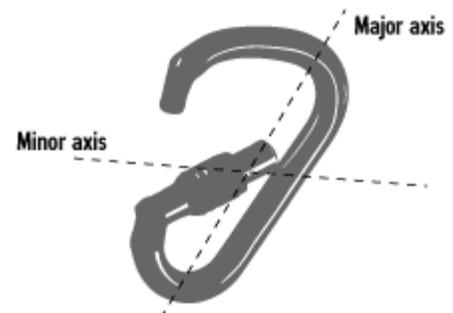
Too little gate-open clearance may lead to your finger getting stuck between the gate and the carabiner body while clipping; too deep a clearance can also make the carabiner difficult to clip. An ideal amount makes clipping the 'biner easy.

## Carabiner Weight

In general, the less weight you carry with you as you climb, the better. But lighter carabiners are not always best. Superlight carabiners are often smaller, which can make them harder to use when you're clipping the rope or a bolt. Also, lightweight carabiners often use narrower rod stock, which can mean lower gate-open strengths and shorter lifespans. 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.

## Carabiner Strength

Carabiners are rated for strength in three directions: lengthwise (major axis), sideways (minor axis) and while open (major axis open or "gate open"). These ratings are typically marked on the spine of the carabiner. All climbing carabiners pass UIAA and CE standards, which means they are plenty strong enough as long as you use them correctly. Gate-open strength and minor-axis strength are where you see the most variation. If one carabiner provides everything you need and is stronger than the others, then you might as well go with that one. Keep in mind that smaller and lighter carabiners are generally weaker than bigger, heavier ones, but not always.

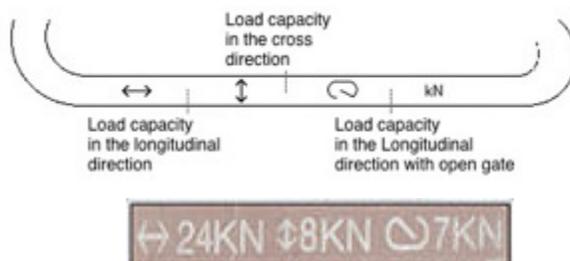


## Markings

Each carabiner must show the basic information: Load capacity in longitudinal and cross direction and load capacity with open gate. According to the latest standards the strength must be specified in kN. In older types we can also see other units:

kg: 100kg=1kN;      daN: 1 daN =1 kg

A number stating load capacity marked on the spine of the carabiner is actually the breaking strength, when the carabiner snaps (not the value of the regular load). Value should be an integer in kN, rounded down from the test value.



## Use Markings

As per Standard EN-12275, European carabiners are marked on the side with single letters in a circle showing their intended area of use, for example, K ([via ferrata](#)), B (base), and H (for belaying with an Italian or [Munter hitch](#)).

| Code             | Use                                       |
|------------------|---|
| B (basic)        | Normal use                                |
| D (directional)  | Quickdraws                                |
| H (HMS)          | Belaying                                  |
| K (Klettersteig) | Via Ferrata/ Klettersteig (climbing path) |
| Q (Quick Link)   | Screw gate or Maillon rapide              |
| X (Oval shape)   | Aid Climbing                              |

## Which Carabiner To Use

Once you understand how shape, gate type, size, weight and strength affect performance, it's helpful to think about how you'll be using the carabiners.

Features that make a carabiner great for one type of climbing might not make it so great for another. For example, small wiregate carabiners can be great for racking gear to keep your rack light or for making lightweight trad quickdraws, but they won't be as easy to clip as larger, heavier carabiners.

Most experienced climbers develop a preference for carabiners of a certain size and shape and with a certain gate type. If you're just starting out, here are some general recommendations:

| Use                       | Type of Carabiner  |
|---------------------------|--|
| Belaying and rappelling   | Large pear-shape locking carabiner                                       |
| Sport-climbing quickdraws | Asymmetric D carabiners with straight gates, bent gates and/or wiregates |
| Trad-climbing quickdraws  | Asymmetric D carabiners with wiregates                                   |
| Racking trad gear         | Asymmetric D, D or oval carabiners                                       |

Once you've narrowed down your search, it may be helpful to visit your local outdoors or other climbing shop. Grab a few models 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. For locking 'biners, 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.

## Similar Devices

A **maillon**, **maillon rapide** or quick link is a metal link, similar to a carabiner. **Maillons** have a threaded sleeve which tightens over a thread, as opposed to a hinged gate like a carabiner, making them stronger, but more difficult to use.



STANDARD



DELTA



SQUARE



TRAPEZE

Maillons are used primarily in climbing and caving. In caving, they are used to make secure and vital connections such as those required when using single rope technique, or for attaching ropes to anchor points. In climbing, they are used to construct leave-in-place abseil/repelling anchors. Maillons can also be used for fastening harnesses with a dual attachment point such as reserve parachutes to a jumper's harness.