

Helmet

Use helmets that comply with European standards EN397 and EN12492. Long hair should be tied up and secured as it may get caught between the descender and rope.



Rope

Generally, a static rope (in the broad sense) with a kernmantle construction is used, having a load capacity of 18kN or more, a diameter of 9mm to 11mm, and an elongation rate of 5% or less.

Rope External Structure

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Rope Internal Structure

In the case of a polyamide core, the rope structure consists of a "core" made of approximately 10 bundles of twisted rope, each approximately 3mm thick, covered by a tubularly braided "sheath."

The rope is characterized by its resistance to kinking (twisting) and low elongation.

Once sufficiently proficient in rope access and able to reliably avoid rope abrasion, 8mm diameter rope may also be considered as an option.



Connectors

There are mainly two types: carabiner type and maillons type, with materials primarily being aluminum (lightweight) and steel (heavier than aluminum but stronger). The shape and strength vary depending on the application, and the appropriate equipment should be used in the appropriate place.

1 Carabiners

Classification by Carabiners' shapes

Oval Type

Elliptical carabiner.
Symmetrical, suitable for connecting to FIXE pulleys or hand ascender top holes. Most versatile.



Asymmetric D Type

Asymmetrical. Easy to clip.
This shape allows for high strength and large gate opening width. Since high strength is easily achieved, most carabiners specialized for weight reduction are of this type. Widely used in rock climbing. Not popular in SRT due to low versatility.



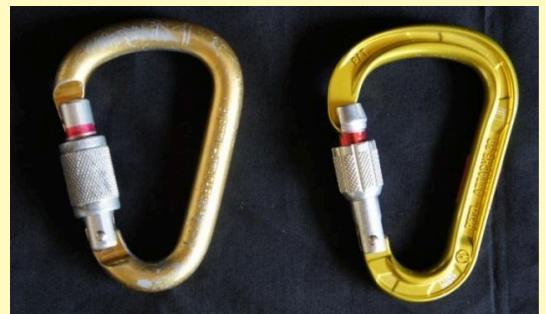
HMS Type

Pear-shaped and symmetrical. Wide gate opening, suitable for Munter hitches knot or carrying multiple gear. Since the tip is symmetrical. It is also suitable for FIXE pulley or hand ascender top hole connections.



Delta Type

Symmetrical, small triangular shape. Suitable for reducing distance between connected objects or weight reduction.



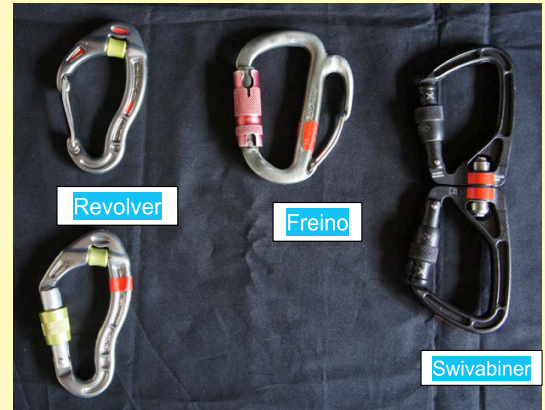
Demi-Round Type

Semi-circular carabiner. Used as the main attachment for seat harnesses.



Specialized Type

From left to right, there are carabiners with an integrated pulley at the tip (DMM Revolver), those equipped with an additional braking bar designed for use in conjunction with a descender (PETZL Freino), and carabiners with a built-in swivel (Rock Exotica Swivabiner). The Revolver is convenient when attached to a hand ascender, as it allows for immediate construction of a Z-rig (3:1 mechanical advantage).



Classification by Safety Gate Type

No lock

Type without safety lock. Used for load suspension or at zero-point belay locations when using hooks.



Manual Locking Gates

Manually twists the gate covering the gate to lock it. Used where accidental gate opening must be prevented. Mainly used for rigging (anchor construction, re-belay, etc.)



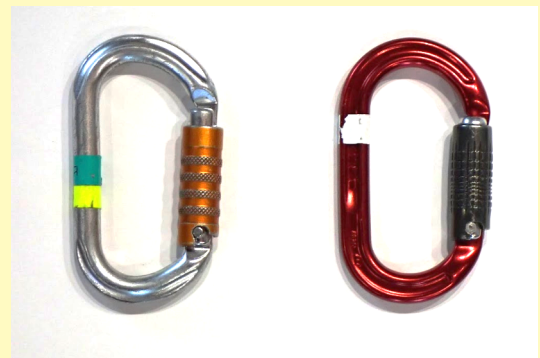
Automatic Locking Gates

A spring is built into the sleeve that covers the gate, and when the hand is released from the gate-open position, it automatically transitions to the locked state.



Tri-Action Locking Gates

Malfunction-prevention safety gates with one additional twist beyond auto lock. Used at locations requiring reliable locking that are rarely opened once set. Used for harness main attachments or connections between descenders and main attachments.



2 Maillons

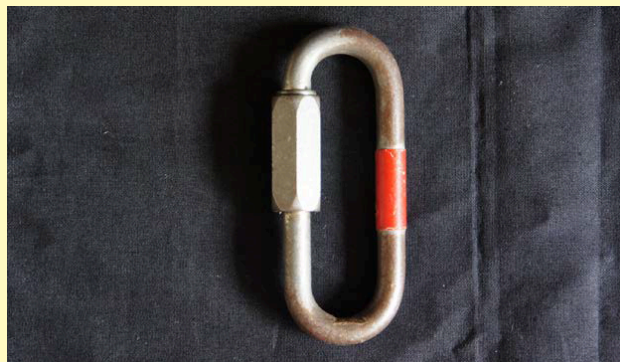
Speedy Type

Gate opens/closes with 3-4 turns and slides to full opening. Allows rapid installation and removal. Available in both aluminum and steel.



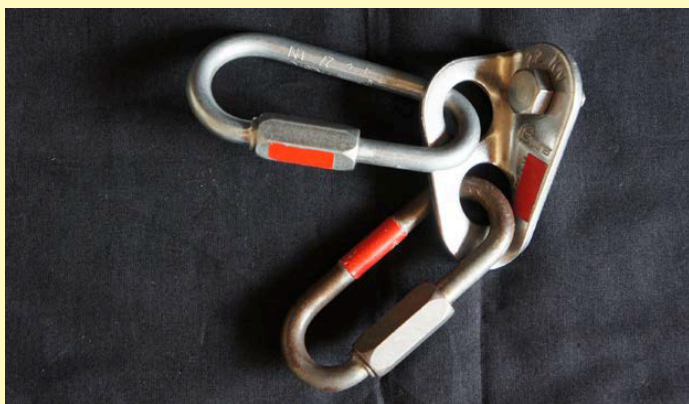
Rapid Type

The gate section is fully threaded, requiring rotation of gate threads corresponding to opening amount for gate opening/closing.



3 Combination of Shape and Materials

When Using Stainless Steel Hangers



Use steel connectors with stainless steel hangers.

If aluminum connectors are used under load, the difference in hardness will cause the aluminum side to be sharply abraded.

When Connecting to Pulleys or Hand Ascender Top Holes

When connecting to wide pulleys such as FIXE pulleys or to the top hole of a hand ascender, use HMS-type or oval-type carabiners. When connecting to attachment holes positioned on two separate parallel plates, if the shape is not symmetrical, the load will not be evenly distributed across the two plates.

