

## PROTECTED PATHS

There is a great difference between a protected path and a via ferrata - a **protected path** just makes dangerous and exposed sections of a hiking trail easier and safer. It does not help you negotiate sections of vertical rock as does a via ferrata.



## VIA FERRATAS

The term **via ferrata** (Italian for “iron road”) is applied to everything organised, prepared and fixed to help you go up (or rather, climb) a rock wall which would otherwise have to be negotiated roped together. To do this requires specific preparation obtained by attending a training course organised by the CAI (Italian Alpine Club) or guides.



## SOME ADVICE

### Quality of the equipment

- Always use harness, via ferrata kit, carabiners and helmet with the **CE and UIAA** mark.
- Use only **K type carabiners** made and tested specifically for using on via ferratas.
- **Put your helmet on as soon as you approach** a rock wall as rocks may often be dislodged by hikers preceding you. Depending on the type of route, the same is true when you return.

### Attaching to the harness...

**Never use a carabiner to attach the via ferrata kit to the harness.**

Use the sewn slings provided with the via ferrata kit, the rope termination or a type Q maillon rapide (quick link) certified for mountaineering (not however recommended).

### You should bear in mind that...

**With the “Y” kit:**

- both carabiners should always be attached to the line;
- detach and reattach them one at a time only after passing the anchor points between sections.

### You should bear in mind that...

Always precede one at a time along a section between two anchor points or, better still, leave one section between the person in front of you and the one behind. Maximum safety can be achieved not just through correct use of the right equipment, but also by paying close attention to what you are doing, what others are doing and what is happening around you. Accidents often happen not because of your own carelessness or incapacity, but because of other people’s mistakes (falling rocks, clumsy attempts to “overtake”, etc.).

### You should always check...

- ...the condition of the climbing aids and fixtures.
- Pay attention to equipment which is faulty, detached or missing!!!
- Pay attention to signs and indications along the route.



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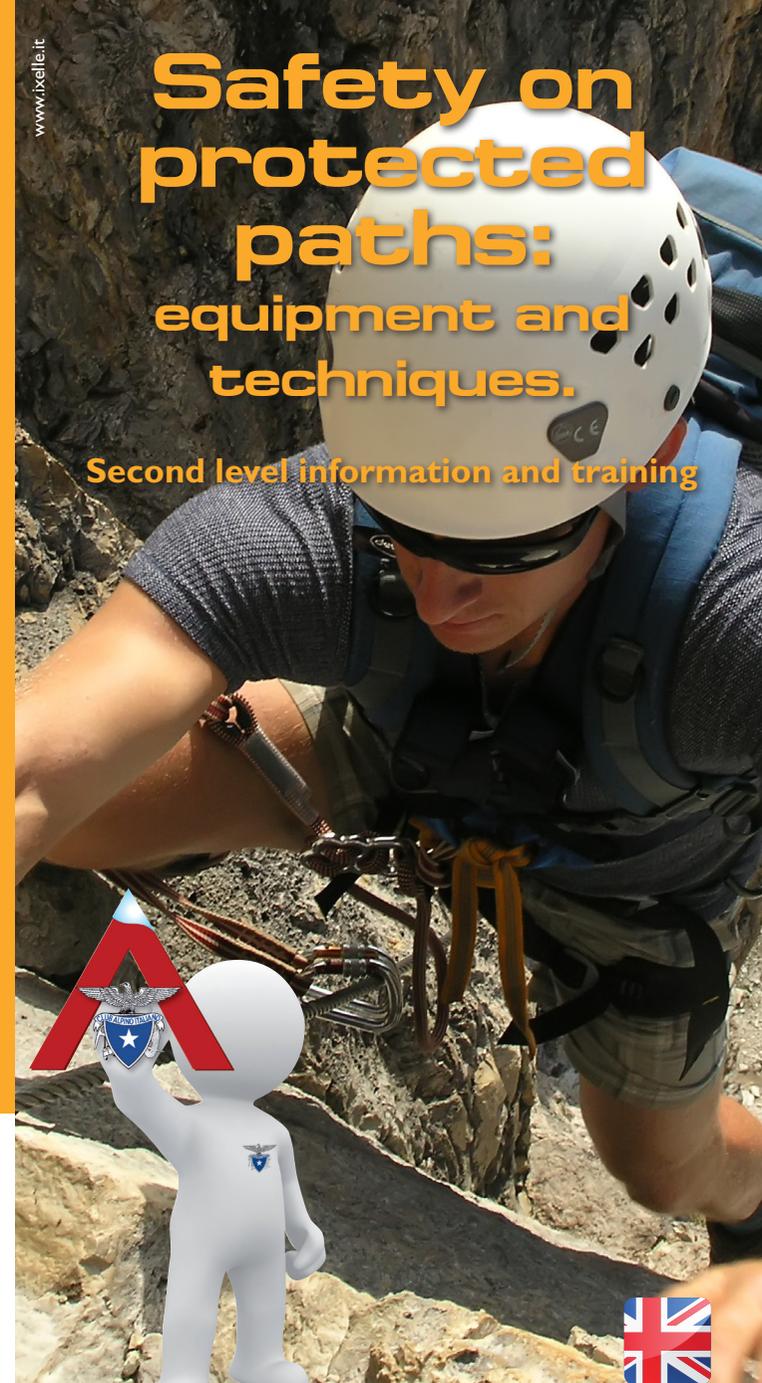


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# Safety on protected paths: equipment and techniques.

Second level information and training



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## THE VIA FERRATA KIT: STANDARDS

### 1. Static testing of running of the rope in the shock absorber

The via ferrata kit is connected to a slow traction device which keeps it under tension.

The rope must start running in the shock absorber with loads of more than 1.2 kN (120 kg).

If you hang from a ferrata kit to test it, it is therefore normal for the rope not to run.

It would be worrying if it did!!!

### 2. Dynamic testing of the kit

A free falling mass is used to simulate the fall of a climber.

The test conditions are:

- 80 kg mass in free fall without friction
- Height of fall: 5 m
- A 1.20 m length of rope available for running (the piece of rope coming out of the shock absorber)
- Conditioned via ferrata kit (controlled temperature and humidity).
- The maximum impact force must not exceed 6kN (600 kg)
- Running of the rope in the shock absorber < 1.20 m

### 3. Static testing of the shock absorber

After the dynamic test, the shock absorber alone is submitted to static traction. The shock absorber must not break with loads of less than 9 kN (900 kg).

Bear in mind that a via ferrata kit cannot be approved and sold if it fails just one of these tests.

Only the "complete via ferrata kit" can obtain the CE label (conforming to the requirements) for compliance with European standards.

The term "complete via ferrata kit" is used to describe the system consisting of the rope (or webbing) and the shock absorber.

## USING "V" MODELS

With the "V" kit, to allow the shock absorber to function correctly and therefore the rope to run, it is essential that the safety line is always attached to just one of the two carabiners at a time, except when passing from one section to the next (passing the anchor point).

With the "V" kit, if you fall, just one of the two carabiners acts on the climbing aid (anchor), appreciably reducing the safety margin.



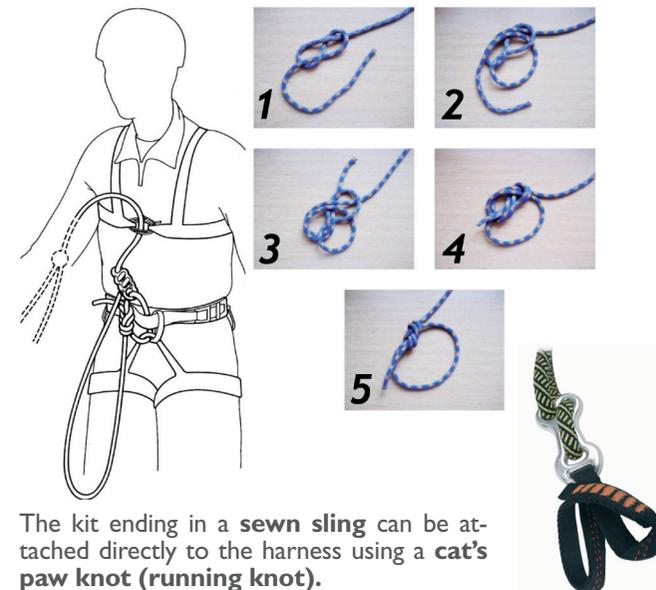
## USING "Y" MODELS

The "Y" kit enables **both carabiners to be attached simultaneously**, considerably reducing the risk of breakage. To use the "Y" kit correctly, it is essential that as you proceed, the length of rope coming out of the shock absorber is always completely free from all **hindrances and knots**.



## ATTACHING THE KIT TO THE HARNESS

The kit terminating in a **length of rope** can be attached directly to the harness with a **reverse figure-eight knot**.



The kit ending in a **sewn sling** can be attached directly to the harness using a **cat's paw knot (running knot)**.

### Important!!!:

Make sure the junction between the two arms the carabiners are attached to is always above the cord closing the top part of the harness.

If the knot was below this, the efficiency of the entire system would be completely lost. If the rope became tangled in the cord, it would prevent it from running in the shock absorber.



## WHAT YOU NEED FOR YOUR SAFETY

To proceed safely along protected paths and via ferratas, you need equipment guaranteeing protection against the risks deriving from the exposure of the route, falling rocks and possible unforeseen circumstances (sections with snow, landslides, etc.).

### 1 – HELMET

### 2 – HARNESS

### 3 – VIA FERRATA KIT

#### The helmet

Many models are available in various colours and styles, but it is important that the helmet is approved for rock climbing as shown by the CE and UIAA label inside. Even if you are not going to try your hand at a protected path, a helmet is still vital whenever a path passes near a rock wall or along the base of a scree slope to protect against falling rocks.



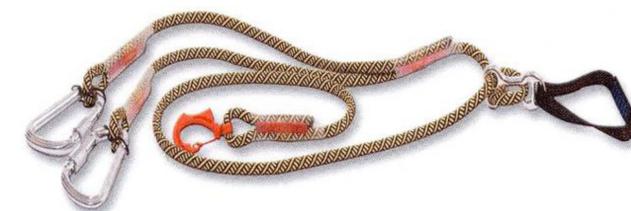
#### The climbing harness

This may be either complete (traditional) or combined (chest, waist belt and leg loops). If you fall, both distribute the probable jerk on the body correctly. A low harness (waist belt and leg loops) is recommended only when not wearing a backpack.



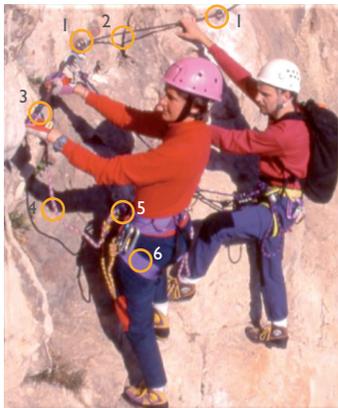
#### Ferrata kit

Although a number of alternative ferrata kits are available, we recommend the “Y” model, obviously approved as shown by the stitched CE and UIAA label. These shown below are all “Y” models with rope or webbing, shock absorber and two carabiners for via ferrata (or with sleeve with wide base).



# WHY IS THIS EQUIPMENT NECESSARY?

## THE SAFETY CHAIN



The aim of building the "safety chain" (all the elements which attach the climber to the rock wall) is to sustain the shock and absorb the kinetic energy acquired by the body during a fall, thus reducing the stress on the climber and the elements in the safety chain.

### Legend:

- |                          |                           |
|--------------------------|---------------------------|
| 1. The anchor points     | 4. The cord/kit           |
| 2. The metal safety line | 5. The shock absorber/kit |
| 3. The carabiner/kit     | 6. The harness            |

## THE CONCEPT OF FORCE

### Impact force

The impact force is the maximum force a body is subjected to during a fall.

The human body can tolerate a maximum deceleration force of 15 g without suffering permanent damage. For example, this is how the diameter of a parachute is calculated. If the mass of the falling body is 80 kg, the maximum tolerable force is:

$$f_a = 80 \times 15 \times 9.81 \approx 1200 \text{ daN.}$$

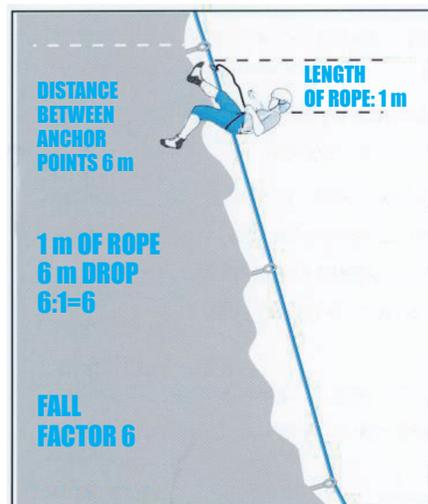
All technical climbing equipment is produced respecting this constraint: **1200 daN**.



## FALL FACTOR FF=H/L

Rope for mountaineering is made according to standards based on the fall factor (FF).

The F.F. can have a maximum value of 2, defined using a blocked rope with the fall energy dissipated by the rope alone, in other words, in the worst possible conditions which may occur during a climb. One of the standards applied to rope for mountaineering specifies that under these conditions, the maximum force generated by the rope must be equal to **1200 daN**, in other words the maximum the human body can tolerate.



On a via ferrata, conditions resulting in a Fall Factor greater than 2 (5, 6, 7 or more) are absolutely normal.

In these conditions, the forces possibly generated with a blocked rope may be much greater than **1200 daN** and are therefore highly dangerous.

On a via ferrata, you therefore need to use a shock absorber, a device which guarantees controlled running of the rope and dissipation of the kinetic energy through friction.

