

## Personal fall protection equipment checklist

### Rope and fabric checks

Rope and webbing used in PFPE are selected for their strength and elasticity under load. Manufacturers do try to choose materials with good resistance to wear and tear, but in most cases the "best" choice is a polymer such as nylon that's far from happy when exposed to heat, sunlight, chemicals or sharp edges. Your basic checklist is therefore:



- **Label:** is it legible, does it have the CE marking, and is the product too old? All textile PFPE will have a defined lifetime, based either from the manufacture date or the date of first use, and you must withdraw the equipment from service when that time arrives (if not before).
- **Cuts and abrasion:** some minor furring of the outer fibres is acceptable (and inevitable with regular use) but anything more than that is a problem. Cuts to the edge of webbing are a major problem as the "lock thread" holding the webbing together can be broken, and any cuts to the sheath of a rope which unravel the weave or expose the core fibres are a failure. On harnesses, pay attention to the areas of maximum wear: attachment points, leg loops and places where tools can rub against the belt.
- **Stitching:** the sewn joins in textiles (both rope and webbing) start off stronger than the base material. However, even one broken thread in a stitch pattern is grounds to scrap the equipment; under an impact load the thread could unravel. The need to examine stitching in detail is why it's usually a contrasting colour, but you don't need to remove padding or sleeves to look at stitching that's normally protected.
- **Chemicals:** staining, smells, stickiness or stiff areas indicate some form of chemical contamination. Unless you know what the chemical is, and have checked with the manufacturer of the PFPE that it's OK, you must scrap the item. There are "nasty" chemicals such as petrol that aren't very harmful, while things like washing powder and seawater can do terrible damage.
- **UV light:** all polymers are susceptible to ultraviolet light damage, and textiles are no exception. Left outdoors or draped on a car's parcel shelf, webbing can lose over 50% of its strength in a couple of years. Rope is a bit less susceptible as the core fibres are hidden, but many sport climbers have been killed after belaying to a rope or webbing sling left in situ on a route, even in the permanent gloom of Britain. It's true that the dyes used in most PPE are also UV-reactive, so they will fade to indicate the level of exposure, but waiting until your navy-blue harness is sky-blue is not a good idea. Stored properly, items used every day will hit their product lifetime before they can hit their UV exposure limit.
- **Burns:** it may be an accidental tap from a hot drill bit, sparks from a grinder, or the friction of ropes rubbing against one another, but even a small amount of heat will destroy your gear. Industrial harnesses and lanyards are often exposed to radiant heat from work tasks, and should never be force-dried by hanging them on a radiator or in front of a gas fire, but if you're grinding out rivets you can't avoid sparks hitting your PFPE, so daily (or twice-daily) checks become all the more important. On harnesses, look at the webbing either side of the buckles for a glazed region; this "witness mark" is a sure sign the harness has suffered a fall.
- **Dirt and grit:** while a bit of grime isn't necessarily a problem, sharp-edged grit such as sand or metal shavings will act like tiny razor blades, cutting through your rope or webbing each time it bends. One day it'll come back to bite you. This is why seawater is so dangerous; it's the sharp crystals of salt which form when it dries which do the damage, so climbers on sea cliffs will soak their gear in fresh water to remove the salt.

### Metal checks

As with fabric, we choose metals based on their physical performance and cost rather than their resistance to damage. It would be nice if every buckle and karabiner was made of gold-plated titanium, but we can't form all the shapes needed, and nobody would pay that much. So we tend to see a mixture of aluminium alloy, plated mild steel and stainless steel.

- **Label:** is it legible? Most all-metal PPE will not have a defined lifetime, so you could use a karabiner for 50 years provided it was serviceable, but without a serial number to trace the inspections, it's not work-legal.
- **Corrosion:** even coated or stainless steels can rust. Points where dissimilar metals touch, such as the steel rivets in your aluminium scaffold hooks, are usually the first to suffer. Whether the corrosion is visible isn't really all that significant; a karabiner can be brown and horrible, but perfectly OK to use. Shiny alloy components will very quickly tarnish, but that has no effect on strength. If the springs inside your self-retracting lifeline get even a little bit rusty, you'll plant yourself. Stress corrosion cracking can be totally invisible to the naked eye, but has caused many disasters. If in doubt, ask the manufacturer.
- **Stiffness:** the feel of moving parts is a useful indication, so if a spring-loaded gate or buckle is stiffer than expected it needs a closer look, but there's no hard-and-fast rule. Some moving parts are designed to start off stiff and loosen over time, in others that's a sign of imminent failure. Read the instruction manual, and compare it with another.
- **Wear and abrasion:** minor scratches are fine, but deep gouges or cracks are not. Look for sharp edges, especially where metal and fabric come in contact (such as the edges of a pulley).
- **Deformation:** under normal loads, metal connectors and other devices will remain elastic, so there won't be any permanent deformation. If there is, it's been abused, dropped, or has received a fall. Compare like with like, though the first sign of deformation is usually a problem with a moving part.

### Functional checks

- **Is it all there?** Broken components are easy to spot, but to spot that a missing bit is missing, you either need to know what it used to look like, or have another to compare it with. Everything counts; you cannot allow "faulty" PPE in a workplace, so even if you never intend to use the gear loops on your harness, they still have to be there.
- **Does it work properly?** Does the gate on your karabiner or scaffold hook close every time? Does the self-retracting lifeline retract all the way, like it used to? Does it sound rough when you pull on the cord?
- **Has the device been involved in a fall?** Equipment with an energy-absorbing element will indicate deployment in some way. The absorber on a lanyard will tear open, the connectors on self-retracting lifelines or vertical ladder systems include a label which appears after a fall, or have a tension-measuring device on the cable. There's no such thing as "partly used"; PFPE is allowed to arrest one fall and one fall only before it's scrapped, even if the energy absorber has barely deployed, it goes in the bin.