

PPE on the ice

PPE is very important to protect yourself against injuries during work. The following text does only describe the general protection abilities of the respective PPE and the situations when it has to be used. In harsh conditions of the polar regions additional measures have to be taken to generally protect yourself against the cold. Information regarding proper protection against the cold can be found here: [Clothing for field work](#)

Safety shoes

Protect the user from foot injuries and need to be worn during work on the ice, if there is the risk of falling or pointed objects as well as hot or corrosive liquids. Due to the fact that safety shoes can cause a quick heat loss due to the steel cap, they can be an inappropriate choice for longer work on ice. If safety shoes are necessary to be worn during special work duties on the ice, consider to take warmer polar boots with you to have the chance to change your footwear if possible.

Working life vest

There is a danger of falling into the water during many different jobs. Vests need to be worn on the ice:

- when working with clothing without flotation ability

Attention: self inflating working life vests can only be used up to temperatures down to -20°C. Below it cannot be guaranteed that the inflation mechanism is working properly.

Gloves

Protecting the hands is necessary if rough, sharp, cold, hot or live parts must be touched. Handling irritating or corrosive liquids require safety gloves as well. If unsuitable or no hand protection is used, skin-abrasions, cuts, burns, frostbites, chemical burns or electric flashovers might occur.

Selecting Suitable Protective Gloves:

For each individual job the suitable type of protective glove must be selected.

It must be ensured that the protective gloves

- provide sufficient protection from the existing hazards.
- are suitable for the existing conditions in the work place, e.g. high or low temperatures, dust or wet conditions.
- do not hinder the works to be carried out, e.g. by limiting the sense of touch.
- provide a good wearing comfort, e.g. by consisting of a flexible material or by limiting the sweating in the glove.
- provide a good skin compatibility, e.g. if the user has allergies or if her or his skin is incompatible.
- fit the user well – the size of the gloves must be selected accordingly.

Helmets

Some jobs on the ice can be dangerous due to objects falling, toppling, swinging or flying off from moving parts as well as hitting one's head on parts of machines or facilities. By not wearing an effective head protection, life-threatening injuries can result. A suitable head protection must always be worn when carrying out jobs which might cause tools or objects to fall, topple, swing or fly off. It is also important to use a head protection in work places where it is easily possible to bump one's head due to a constrained posture or the narrowness of the space. Wearing helmets on the ice is especially important when handling equipment with the tripod, working on masts, handling chain saws and working aloft or on ridges.

Ear protection

Hearing protection protects the ears from harmful noise. Noise-induced hearing loss can develop as a result of missing or insufficient protective measures for the ears. The disease develops very slowly and is often noticed only when the damage is already in an advanced stage. Noise-induced hearing loss cannot be cured. Noise causes hearing loss and other serious health problems. Expedition members who are exposed to harmful noise during their work must be provided with a suitable personal hearing protection. The expedition leader and group leader decide in which areas and during which jobs the ear protection has to be used.

Personal hearing protection has to be provided if the daily exposure value is 80 dB or higher. If the daily exposure is higher than 85 dB, using the hearing protection is compulsory.

Hearing protection has to be used on the ice in all noisy environments, e.g. when using chain saws

Attention: It can be difficult to notice warning signals, e.g. regarding polar bear sighting, when using hearing protection on the ice!

Eye protection

Eye and face protection protect the eyes and the face from mechanical, thermal, visual and chemical hazards. Hazards to the eyes and the face can develop during many jobs on board. Eye and face protection must be selected to provide protection from the particular exposure or risk.

Various types of safety goggles and face shields provide protection from different hazards, e.g. from:

- mechanical effects, e.g. due to dust and particles in the air during grinding, cutting and derusting works
- an exposure to heat, e.g. as a result of heat development during welding and flying sparks
- risks to the eyesight, e.g. due to strong light while welding or the exposure to sun light on deck
- chemical hazards, e.g. splashes of operation bunkering, cleaning or painting
- biological hazards, e.g. while working at the waste water system, during waste treatment and during the cleaning of filters of the air condition system

Selecting the Correct Eye and Face Protection:

A suitable eye and face protection must be selected for each job in order to provide sufficient protection from the existing hazards.

Only approved gloves are permitted for use. The labelling and the manufacturer's instructions for use on the gloves or on the package must be followed. They inform the user about possible conditions of use and the protective effects of the gloves.

Recommendations on How to Select Protective Gloves:

- The leather gloves, which are frequently used on board, only protect the user from mechanical effects.
- If there is an exposure to mechanical and thermal effects, e.g. during welding or cut-off grinding works, leather-only protective gauntlet gloves must be used.
- When working under wet conditions or with chemicals, gloves made from suitable synthetic materials which are resistant under wet conditions or to these chemicals must be selected.
- Insulating protective gloves are selected for work at live parts according to the actual voltage class.

Consider to wear underlayer below the protective gloves to keep your hands warm.

Safety harness

Safety harness needs to be used if work is carried out at a distance of two meters or less from the ice edge, on meltponds that are going completely through the flow (> hole in the flow) or are deeper than 1 meter and on ice holes with a diameter of 1,5 meters or more. The reason that there is no strict requirement of wearing safety harnesses at ice holes with a diameter with less than 1,5m, is that many persons are working on these holes who have to frequently move around the hole, which makes securing by ropes unfeasible. Another reason is the fact that the risk of completely falling into these holes with the whole body is very low. If you are working alone on holes with a diameter of less than 1,5 meters or if you have to lean over the hole to pull something out of the water you have to secure yourself by safety harness and rope.

When taking a safety harness on, you start to fasten it at the shoulder straps. Afterwards you close the leg straps and finally the breast hook. A safety harness is only usefull if it is firmly fixed to your body. To secure yourself you need to put an ice screw into the ice (always remember to fully turn the screw into the ice). If there are no ice screws available it is also possible to drill two holes in approx. 45° angle into the ice in such a way that both ends of the holes meet each other. You can thread the securing rope through one hole, take it out through the other one and make a bowline to connect the end at the rope. This securing method should only be used if the ice is solid enough to not break out in case of body weight is put on the ice.

There should be a few meters distance between your designated working place and the securing point (screw or else). If possible, try to find a securing point that is relatively perpendicular to the ice edge. Always put the ice screw in direction of the current if there is any under the ice which is visually detectable. Means if you are facing towards the direction where the current is coming from, you should also face the ice screw. If you will fall into the water you will be drifting away from the screw, the securing rope will become tight and you can easily be pulled out by your colleagues against the current. If two or more persons are working at the same spot they have to install additional ice screws for securing so that everybody has its own anchor point. Ice screws which are used for securing purposes must not be used for other reasons at the same time (e.g. fixing a device, tent or else).

- be suitable for the actual conditions in the work place, e.g. for high or low temperatures, dust or in wet conditions.
- not hamper the works, e.g. by impairing the field of vision of the user.
- provide a good wearing comfort.
- fit the wearer well.

The safest eye protection to be used are safety goggles which are adjusted to the actual work conditions. Only eye and face protection with the appropriate test symbols has to be used.

Protective Masks and Face Shields:

If an additional face protection is necessary, a protective mask or a face shield has to be used, e.g. when handling chain saws (see below)

Cut proof protection

When handling chain saws it is necessary to wear cut-proof clothing for the legs. Cut-proof trousers can be worn but are unflexible during field work because they cannot be worn on top of the general clothing. Changing clothes on the ice is not comfortable and should be avoided in terms of heat loss. Cut-proof chaps are the preferred solution, as they can be worn on top of the normal clothing and can quickly be taken on and of as required. Ear and face protection and helmets are to be worn as well as cut protection covers for the boots.