# OSH management systems and operating methods (A)

## Items on the checklist

The checklist for OSH management systems and operating methods includes issues that are difficult to group under a single checklist and which mainly apply to the entire workplace. In contrast to other lists, the issues are considered to be either in order or not in order. OSH management systems and operating methods are means used to control risks so that they are not hazards, and they are not used to assess the extent of a risk. It is a good idea to mirror the issues on the checklist on different aspects of workplace activities, such as an exceptional or disturbance situation, shared workplace sites, new employees, etc.

**H 1 Occupational safety and health policy** The workplace has a statutory obligation to draw up an occupational safety and health policy. The policy must incorporate the need to develop the working conditions and the impact of the working environmental factors. Various models are available for drawing up an occupational safety and health policy. The policy for a workplace with at least 30 employees can also include actions to enhance the realisation of equality between women and men at the workplace.

**H 2 Occupational health care** The employer must arrange occupational health care for its personnel (Occupational Health Care Act 1383/2001). Occupational health care activities start with workplace needs and are proactive measures to fulfil the basic requirement of the Occupational Safety and Health Act and promote the health and safety of work and work ability. A written agreement must always be made concerning the organisation of occupational health care services. An occupational health care action plan based on a workplace investigation is part of the occupational safety and health policy. If desired, an employer may also organise medical treatment services for its personnel.

**H 3 Occupational safety and health cooperation** Occupational safety and health cooperation at the workplace must be arranged in an appropriate manner. The Occupational Safety and Health Act (738/2002) obligates the employer and employees to cooperate in maintaining and improving safety in workplaces. The appointment and duties of the occupational safety and health manager, occupational safety and health representative and occupational safety and health committee are laid down in the Act on Occupational Safety and Health Enforcement and Cooperation on Occupational Safety and Health at Workplaces (44/2006). The employer shall nominate an occupational safety and health manager unless the employer wishes to take the position. At workplaces where at least 10 persons work regularly, the employees shall from among themselves choose an occupational safety and health representative and two vice representatives. At workplaces where at least 20 people work regularly, an occupational safety and health committee shall be established.

**H 4 Orientation and introduction training** Orientation is activity by which a new employee in particular becomes familiar with his/her workplace, its operating methods and the people working there. An introduction to work must include all functions that are relating to doing the work. Orientation and introduction training are extremely important for new employees, but also for persons who have been absent for long periods or who have changed jobs. The activity is an important part of proactive occupational safety and health.

**H 5 Operations at a shared workplace** The employer exercising the main authority at a shared workplace where employees from several employers work has more extensive obligations that the other employers. However, all actors must ensure that their activities do not endanger the safety and health of the employees.

**H 6 Extraordinary situations and disturbances** Whenever there are extraordinary situations (such as faults, disturbances and errors) or, on the other hand, maintenance, service or cleaning that occurs during normal operations, there is a risk of accidents or other hazards (e.g. due to awkward working positions). Planning and guidelines can be used to anticipate and prevent the hazards caused by exceptional situations.

**H 7 Personal protective equipment** Employees must be instructed in the proper use of personal protective equipment and the use of such equipment monitored. The devices must be sound, appropriate, sufficiently protective and suitable for the work (Government Decision on the selection and use of personal protective equipment 1407/1993). The protective equipment acquired must meet the structural requirements laid down in the Government decision on personal protective equipment [(Government decision 1406/1993)](http://www.finlex.fi/fi/laki/alkup/1993/19931406) and have [CE marking](http://www.tukes.fi/fi/Toimialat/Kuluttajaturvallisuus/CE-merkki/).

**H 8 Use of guards and accessories** The guards and safety devices for machinery and equipment must be in order and they may not be overridden or removed. Accessories must be acquired for the duties in order to avoid and reduce unnecessary strain and the employees provided with instruction in their use. Such accessories include various leg, standing, elbow and wrist supports to reduce static strain or accessories related to the use of tools, such as extension bars and gripping devices.

**H 9 Unsafe actions and intervention in risk-taking** Risk-taking means conscious taking of a risk and risky behaviour. Unsafe actions refers to the use of dangerous working methods or a failure to follow safety guidelines. Unsafe actions can cause an accident hazard not only to the person him or herself, but also to bystanders. Each person working at the workplace must be aware of their own responsibilities and obligations with regard to occupational safety and health. The employer has responsibility for occupational safety and health in the line organisation on the basis of supervisory decision-making and authorisations. The employee also has his/her own obligations (Occupational Safety and Health Act 738/2002).

**H 10 Action programme on substance abuse prevention** The drawing up of an action programme on substance abuse prevention is laid down in the Occupational Healthcare Act. The workplace must have a harmonised practice that has been drawn up in cooperation in order to deal with suspicious situation. Working under the influence of intoxicants or hangovers or drugs increases the accident risk for both the person involved and his/her co-workers.

**H 11 Electrical devices** Electrical equipment must be appropriate, in working condition and they must be used properly. When installing, using and maintaining electrical devices, attention must be paid to the risk of fire or accident due to wrong connections, faults or overheating.

**H 12 Hot work permits and practice** Hot work refers to work in which sparks arise or a flame or other heat is used, and which causes a fire hazard. . When hot work is done in a temporary hot work location, a hot work permit is mandatory.

**H 13 Alarm and rescue equipment** Workplaces must have security systems (e.g. fire-fighting, life-saving and survival equipment) which, in the event of fire, explosion, drowning or other accidents, raise the alarm, protect from danger and help to save lives. The need for safety and survival equipment depends on workplace conditions and the nature of the work.

**H 14 Fire-fighting equipment and labelling of them** Every workplace must have access to water and a sufficient quantity of fire-fighting equipment, i.e. fire extinguishers, smothering blankets, hoses,   
fire extinguishing agents, etc. The equipment must be appropriately and visibly labelled, sound and fit for use, and easily available. Exercises to practice using the equipment must also be organised.

**H 15 Walkways and corridors and their safety and indicator lighting** Walkways must be unobstructed, visible and clear in order to improve safety. Walkways must have sufficient general lighting. Exits must have sufficient reserve lighting and their position must be indicated by an illuminated sign. Safety and indicator lighting must meet the SFS-EN 1838 and SFS-EN 50172 standards.

**H 16 Exit and rescue routes and labelling of them** Every workplace must have a sufficient number of appropriately labelled, clearly visible and easily accessed exits leading to the ground, which must always be kept free. Exits must have sufficient reserve lighting and their position must be indicated by an illuminated sign. Safety and indicator lighting must meet the SFS-EN 1838 and SFS-EN 50172 standards.

**H 17 First aid arrangements and equipment** If necessary, each workplace must appoint persons responsible for first aid and rescue operations, and sufficient training must be arranged for them. The workplace must have enough appropriate first aid equipment. The amount and need is determined according to the workplace investigation and risk assessment. Each employee must possess basic information about the first aid systems at the workplace. The workplace must have clear instruction on how to operate in emergency situations.

**H 18 Personnel preparedness** Each employee must possess basic information about the workplace operating methods in an emergency. The personnel's preparedness must be maintained by means of appropriate training.

# Physical hazards (F)

## Items on the checklist

Physical hazards are hazards that arise at work due to the influence of various forms of energy. They include noise, temperature, lighting and radiation. The physical hazards checklist is well suited for almost all work inspections, since the items it contains generally affect working environments and apply to all types of work.

**F 1 Continuous noise** refers to the prevailing noise energy to which the employee is exposed. The higher the daily noise exposure level, the more likely noise is to cause harm to hearing. The following operating values relating to the daily noise exposures of employees are prescribed by law (Government Decree 85/2006):

– the lower exposure action value of 80 dB(A) ; if this is exceeded, the employer must be aware that this may weaken the hearing of some employees. As a result, the employer must provide instructions and guidance concerning the hazards of noise and extent of the risk and provide personal hearing protectors for the employees.

– the upper exposure action value of 85 dB (A) is the limit for dangerous exposure; if this is exceeded, he employer must prepare a noise abatement programme aimed at reducing the noise to a safe level. When the danger of impaired hearing exists, the employees must use the personal hearing protectors obtained for him by the employer in order to provide sufficient time to eliminate the hazard and reduce the risk.

– the limit exposure value of 87 dB (A) is the absolute upper limit for exposure and may not be exceeded even when using personal hearing protectors; if exceeded, the exposure must be reduced and more effective protection provided.

Even lower noise levels may cause harm due to communication difficulties, disturbances to peace of mind or poorer performance. The risk of accidents is also possible when sounds warning of danger cannot be heard due to noise.

**F 2 Impulse noise** is a sudden loud noise caused by e.g. an explosion, crack, collision or impact. A single, loud impulse-like sound wave peak can cause impaired hearing. The following operating values have been set for impulse noise:

– the lower exposure action value of 135 dB(C) (peak sound pressure 112 pascals (Pa)); if this is exceeded, the employer must obtain personal hearing protectors for the employees.

– the upper exposure action value of 137 dB(C) (peak sound pressure 140 Pa); if this is exceeded, the employer and the employer must prepare a noise abatement programme and the employee must use the personal hearing protectors obtained for him by the employer until the impulse noise has been reduced to a safe level.

– the limit exposure value is 140 dB(C) (peak sound pressure 200 Pa); if exceeded, the exposure must be reduced below the limit value, e.g. by improving the effectiveness of protection.

A wide range of measurements and expertise is required for more detailed assessment of impulse noise and very high and low-frequency noise

**F 3 Workplace temperature** When assessing workplace temperature, in addition to monitoring the temperature, the physical strain of the work being performed, humidity and speed of air movement must be examined. Wherever it is possible and necessary, workplace temperature and humidity must be capable of being regulated. Depending on the physical strain involved, the following temperature recommendations have been set for different kinds of work:

* Light sitting work 21–25 ºC
* Other light work 19–23 ºC
* Moderately heavy work 17–21 ºC
* Heavy work 12–17 ºC

**F 4 General and local ventilation** The general ventilation system must be sufficient and arranged in the most appropriate way. If necessary, it must be supplemented with local ventilation.

**F 5 Draught** A draught is an incoming air flow that is cooler than the room air. If the air flow velocity is 0.15-0.5 m/s, a draught is normally considered to be harmful. It is certainly draughty when the air velocity exceeds 0.5 m/s. Open external doors or windows may cause a disturbing draught.

**F 6 Cold or hot objects** can cause injuries from burns or extreme cold. Hot or very cold parts of work tools must be protected, if necessary, so that workers are in no danger of touching them or coming too close to the tool. Workers must have the necessary protective equipment to handle cold or hot objects.

**F 7 Working outdoors.** The risks of outdoor work are affected by the length of time spent outdoors, air temperature, wind velocity, sunshine, rain and slipperiness.

**F 8 General lighting.** The workplace must have suitable and sufficiently effective lighting as required by the work and the needs of the workers. When assessing the sufficiency of the lighting, consideration should be given to the effect of daylight, the season and time of day, the weather conditions and the use of sunshades and local lighting. The lighting must not cause glare.

**F 9 Local lighting at workstations.** If necessary, the general lighting must be supplemented by local lighting at workstations. This is very important in work requiring great precision. Although deficient lighting does not cause eye injuries, it may increase the risk of accident or fatigue. .

**F 10 Outdoor lighting.** Workplace-related areas (e.g. storage spaces, yard areas, parking areas, walkways) must have sufficient outdoor lighting.

**F 11 Hand/arm vibration** With regard to hand/arm vibration, an investigation must be made into whether the workplace uses vibrating machines or equipment (e.g. pneumatic and electrically driven hand tools, controllers), whether vibration causes problems and whether the workers display vibration-related symptoms. In addition, the need for further investigations must be assessed. The hazards caused by hand/arm vibration occur slowly and the risk of disability resulting from exposure to vibration increases in relation to the amount of the daily exposure level. Vibration measurement and analysis is a job for experts and requires measurement devices suitable for the purpose (Government Decree 48/2005).

The daily exposure action value for hand/arm vibration is 2,5 m/s²; if this is exceeded, the employer must prepare a vibration control programme (Government Decree 48/2005). The limit value for hand-arm vibration is 5 m/s²; if this is exceeded, the employer must take steps to lower the vibration.

**F 12 Whole-body vibration** With regard to whole-body vibration, an investigation must be made into whether the workplace uses vibrating machines or equipment (e.g. mobile work machines, work platforms), whether vibration causes problems and whether the workers display vibration-related symptoms. In addition, the need for further investigations must be assessed. The hazards caused by whole-body vibration occur slowly and the probability of pain and injuries, mainly related to the back, increases in relation to an increase in daily exposure to vibration. Vibration measurement and analysis is a job for experts and requires measurement devices suitable for the purpose.

The daily exposure action value for whole-body vibration is 0,5m/s²; if this is exceeded, the employer must prepare a vibration control programme. The limit value for whole-body vibration is 1.15 m/s²; if this is exceeded, the employer must take steps to lower the vibration.

**F 13 Ionizing radiation.** X-rays, gamma-rays and radon are ionizing radiation. Radiation measurement is a job for experts.

**F 14 Ultraviolet radiation.** UV radiation is present in welding, in certain lamps and in sunlight. Exposure to UV radiation can cause e.g. sunburn of the skin or conjunctivitis.

**F 15 Laser radiation** can cause injury risks e.g. to the eye or the skin. Laser devices are classified according to their risk, as presented in the SFS-EN 60825-1 standard.

Class 3B and 4 laser devices can cause permanent damage to the retina as a result of exposure to direct or diffuse beams (reflected from shiny surfaces).

**F 16 Infrared radiation.** Infrared radiation is present near e.g. heating and smelting furnaces and infrared dryers and heaters. Excessive radiation can be reduced by using reflective materials.

**F 17 Microwaves** are electromagnetic waves. Microwaves are used in e.g. radar and communications technology and in microwave ovens. The microwave-induced hazards are the heating effects, which are determined by the intensity of the field.

**F 18 Electromagnetic fields** Electric and magnetic fields are present near e.g. induction heaters and ovens. High-voltage power transmission lines and cables may also cause significant electric fields. Employees who have a pacemaker or similar medical implant are particularly sensitive to the hazardous effects of electric and magnetic fields. Powerful electric and permanent magnets may also interfere with implants when in close proximity to them. Assessment of the interference hazards is a job for experts.

Legislation concerning the exposure of employees in normal condition is expected in July 2016.

## Estimating risk levels

The probabilities related to the risks arising from physical hazards can be estimated, with respect to those quantities that can be measured, by comparing the measured results with the guideline values, or by examining exposure frequencies and durations. The method for estimating the risk level of physical hazards is described in principle in table 11. Due to the logarithmic nature of noise, the indicative principle for estimating the risk level are presented in table 12.

Table 11. Estimating the level of risk due to physical hazards.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Severity of harm |  |
| Likelihood | Slightly harmful  Discomfort, irritation, temporary minor illness | Harmful  Burns, extended serious effects, permanent minor harm, impaired hearing | Extremely harmful  Occupational cancer, asthma, permanent  serious effects, death |
| Unlikely  Serious effects 10-50% of guideline values | **1 Very low risk** | **2 Low risk** | **3 Medium risk** |
| Likely  Serious effects 50-100% of guideline values | **2 Low risk** | **3 Medium risk** | **4 High risk** |
| Very likely  In excess of guideline values | **3 Medium risk** | **4 High risk** | **5 Very high risk** |

**Table 12.** Principles for estimating the level of risk due to noise

(Source: Finnish Institute of Occupational Health)

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Severity of harm |  |
| Likelihood | Slightly harmful  Discomfort, **irritation**, temporary minor illness | Harmful  Extended serious effects, permanent minor harm, **impaired hearing** | Extremely harmful  Permanent serious effects, serious **accident** |
| Unlikely  Normal conversation possible without raising the voice  Noise exposure level < 80 dB(A),  In "precision" work < 50 dB(A)  Impulse sound peaks < 135 dB(C) | **1 Very low risk** | **2 Low risk** | **3 Medium risk** |
| Likely  Conversation is possible but speech is not completely understandable  In "precision" work < 50...65 dB(A)  Noise exposure level < 80...85 dB(A),  Impulse sound peaks < 135...137 dB(C) | **2 Low risk** | **3 Medium** **risk** | **4 High** **risk** |
| Very likely  Conversation is only possible by shouting  In "precision" work > 65 dB(A)  Noise exposure level > 85 dB(A),  Impulse sound peaks > 137 dB(C) | **3 Medium risk** | **4 High risk** | **5 Very high risk** |

**Example:** The A-weighted noise level for a workplace is 81 dB over a period of 8 hours. There is no impulse noise. What is the risk level of the noise in a space for a full-time employee?

|  |  |
| --- | --- |
| **Hazard:** | Background noise |
| **Description of hazard:** | Noise level 81 dB(A) |
| **Severity of harm:** | Harmful (risk of impaired hearing, concentration  deficiencies, lower exposure action value 80 dB(A)) |
| **Likelihood:** | Likely (full-time, noise level under 85 dB(A)) |
| **Risk:** | 3 |

## Actions to control physical risks

The most efficient and economical way is to eliminate physical hazards during the planning of workplaces. Corrective actions carried out afterwards are usually expensive and difficult to implement. In workplaces that are already operational, noise can be reduced by encasing the machines or equipment that produce the noise, or by bordering the work stations with acoustic screens. It is wise to always examine ventilation-related factors when planning or renovating work stations. The regular measures undertaken to maintain ventilation power include the checking of controls, examination of equipment functioning and maintenance and service. The consequences of excessively high or low temperatures can be reduced by technical or structural solutions and by means of personal protectors and suitable clothing.

# ACCIDENT HAZARDS (A)

## Items on the checklist

Accident hazards involve a sudden and uncontrolled energy source: moving objects, uncontrolled motion or energy. The accident hazards checklist is very well suited to the inspection of jobs involving many different work stages, machines or equipment or where the work is done in changeable working conditions or at shared workplaces. A key element in preventing accident hazards is ensuring that the correct work methods are used. When identifying hazards related to machines, it is advisable to become familiar with the Government Decree on the Safety of Machinery (Government Decree 400/2008) and the Decree on the Safe Use and Inspection of Work Equipment (Government Decree 403/2008).

**A 1 Slipping**. A slipping hazard refers to a situation in which there is too little friction to permit a walking person to stay upright. A slipping hazard exists in indoor and outdoor spaces (yard areas, walkways). The hazard is usually related to smooth and even surfaces. It can be increased by ice, water or other liquid on the surface, and the inclination of the surface. The quality of the footwear and the method of moving also affect safety.

**A 2 Tripping.** A tripping hazard relates to obstacles on the walkway (e.g. pipes, tubes, waste) or irregularities (e.g. thresholds, depressions, pit-holes, level variations) that may lead to a fall. The hazard is increased if attention is focused on something else e.g. when carrying a load or talking on the phone

**A 3 Being lifted or falling from a height.** A falling hazard refers to a situation in which it is necessary to rise (e.g. by climbing) above the working level or walkway, or in which the working level or walkway has a free unprotected edge from where it is possible to fall to a lower level (e.g. there is no railing or there is an unprotected hole or chute in the working level). There is a particular falling hazard associated with ladders and steep flights of stairs.

**A 4 Being trapped in a locked space.** Being trapped when a door or hatch does not open from the inside may cause a serious hazard in e.g. cramped or locked cold spaces.

**A 5 Electric shock or static electricity.** An electric shock hazard arises when a person touches an unprotected live electric wire or other live device. With high voltages it is not even necessary to touch the object; merely entering the danger area is enough to receive an electric shock (arc phenomenon). An electric shock or outbreak of static electricity can as such be fatal, or it can lead to other dangerous situations such as staggering, falling or reflexively grabbing onto something. In addition, electricity can indirectly cause mortal danger if an overheated wire or sparking joint causes a fire.

**A 6 Oxygen deficiency.** An oxygen deficiency can occur e.g. in tanks or other closed spaces used to store oxygen-consuming substances or goods such as wood chips or scrap.

**A 7 Being immersed in water.** Drowning hazards arise in work that takes place near water (e.g. rivers, lakes, the sea, pools, containers) without any barrier against falling. Examples include the construction of bridges and harbours, and the maintenance and cleaning of pools.

**A 8 Goods transport and other traffic.** Internal traffic (forklifts, bicycles, mobile work machines, vehicles) moving on the same routes both indoors and outdoors can cause accident hazards (e.g. collisions). In addition, traffic during working time (e.g. errands) and commuting safety should be investigated.

**A 9 Order and cleanliness.** Good order and cleanliness are the foundation of accident prevention, and they also affect the smoothness of work. Workstations should be organised so that the objects and functions needed most often are within close reach and those needed less often are farther away. Storage of unnecessary goods should be avoided. Order and cleanliness on walkways must also be ensured.

**A 10 Objects being dropped.** There is a danger of objects being dropped when they are stored or moved above floor level. The danger is particularly high when the objects are above head level, e.g. when lifting loads over people.

**A 11 Objects falling over.** Objects can fall over when they are being moved or stored. The hazard can arise when the objects (e.g. piled sheets, boxes, gas bottles) are in an unstable position, stacked or poorly bound, and, in demolition work, when there are deficiencies in the support and securing of load-bearing or supporting structures.

**A 12 Collapse** In excavation work, stone or soil may fall from the edge of the pit onto an employee. The risk of collapse exists if the angle of the pit walls is not sufficient. The hazard also exists on construction scaffolding if the scaffolding is not appropriately selected for the work, application and environment (installation, use and demolition).

**A 13 Objects/materials being hurled around.** Objects and materials can be hurled around when machining takes place at high velocity, as in grinding or milling operations. Hazardous substances can be splashed onto the skin or into the eyes.

**A 14 Hit caused by a moving object.** Moving objects such as machine parts or transferable pieces can lead to unexpected hits if people are working in the hazard area.

**A 15 Being crushed between objects.** Moving objects (e.g. machine parts) may cause an crushing hazard in which a body part (e.g. the hands or feet) or their entire body is crushed or caught between two moving objects or against a fixed structure. Inadequate drain protection can also cause a hazard.

**A 16 Being entangled in a moving object.** The drains and moving edges of machines, conveyors, cylinders and rolls, and the heads of rotating axles give rise to an entanglement hazard. This hazard is increased by the wearing of loose clothing or, for example, long hair.

**A 17 Being slashed, cut or stabbed.** Sharp, thin metal, plastic or glass materials and knives, etc. can cause a slashing or cutting hazard. Sharp, pointed objects (e.g. needles) can cause a stabbing hazard. Needle accidents also involve the risk of infection (such as B and C hepatitis and HIV).

**A 18 Animal or human action.** Kicks and bites are typical examples of human or animal action that causes an accident hazard. There is always a hazard involved in transferring or caring for animals. Physical violence targeting another person has increased in e.g. the health care sector and education sector.

## Estimating risk levels

The probabilities related to the risks arising from accidents can be estimated by examining the frequency of accidents. The seriousness of the effects can be examined either by the length of resulting absences or the nature of the harm caused.

Table 13. Estimating the level of risk due to accidents

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Severity of harm |  |
| Likelihood | Slightly harmful  Absence < 3 days  Temporary minor effects, sprains, bruises | Harmful  Absence 3–30 days  Extended serious effects, permanent minor harm: fractures, burns | Extremely harmful  Absence > 30 days  Permanent disability, death |
| Unlikely  Occasional hazardous situation, occur seldom | **1 Very low risk** | **2 Low risk** | **3 Medium risk** |
| Likely  Daily hazardous situations. Near misses have occurred. | **2 Low risk** | **3 Medium risk** | **4 High** **risk** |
| Very likely  Hazardous situations occur often and regularly. Accidents have occurred. | **3 Medium risk** | **4 High** **risk** | **5 Very high risk** |

**Example:** A warehouse contains several high storage shelves that are used to store heavy metal objects on pallets. Lifts are performed many times per day using forklifts. What is the risk caused by objects being dropped with regard to people who are working in or visiting the warehouse.

|  |  |
| --- | --- |
| **Hazard:** | Objects being dropped |
| **Description of hazard:** | Goods fall from a shelf during lifting. |
| **Severity of harm:** | Harmful (in the worst case death, but the more normal  effects are contusions or bruises) |
| **Likelihood:** | Likely (for persons working in the warehouse) and  Unlikely (for occasional visitors) |
| **Risk:** | 3 (for persons working in the warehouse) and  2 (for occasional visitors) |

## Actions to control accident risks

Good order is the foundation of accident prevention. The accident risk can be reduced in the workplace by keeping walkways, working surfaces and steps in good condition. The falling hazard can be prevented with proper working and moving surfaces and by installing protective structures. The lighting must be in good condition. The accident risks related to the use of machines and equipment can be prevented by acquiring only machines that meet all requirements, by correcting the deficiencies in guards on old machines, and by training the workers to use the machines safely. Accident risks often result from deliberate risk taking, and their control is an integral part of active supervisor control and exemplary conduct.

# Physical strain (E)

## Items on the checklists

This checklist can be used to identify physical strain caused by work postures, tools and working environments. The physical strain checklist is divided into four parts that are interconnected: 1) A thorough discussion of workstation-related matters is extremely important for those working at a fixed workstation, 2) work posture, 3) physical strain, and 4) tools. When examining strain, it is important to also consider the increase in remote work and work performed at different workstations and sites. The level of strain is affected by the different characteristics of people, such as size, functional capacity, gender, knowledge, skills and age.

**E 1 Tool placement.** Good placement of tools facilitates work and increases efficiency. Workspace organisation also has an effect on work postures, movements and the opportunity to change positions during work. If it is possible to sit during the work, seats must be organised for that purpose. The seats must be solid and, if necessary, adjustable.

**E 2 Adequacy of working space.** The capacity and surface area of a working space should be sufficient. The employee should be able to move and change position during the work. The amount of room air should be at least 10 cubic metres per employee.

**E 3 Height of working surface.** The right height of a working surface depends on the nature of the   
work: in work demanding precise movements of the arm and hand, the working height should be higher than the elbow and the elbow must be supported. In work requiring horizontal pulling or pushing the best working level is at elbow height. If the job requires freedom of movement of the arms, the right working height is below elbow height.

**E 4 Visual displays and terminals.** Work done at a visual display unit must be organised so as to avoid any hazards to the eyes or any harmful strain. Planning for this kind of work must consider matters related to the equipment, the working environment and computer user interface as well as matters related to human strain, such as the position of the head and neck. (Government Decision 1405/1993)

**E 5 Posture of back.** Hunched, twisted and lop-sided postures and their combinations strain the   
back. Constant sitting or standing are also hard on the back.

**E 6 Posture of shoulders and arms.** The arms should always be lower than shoulder level. Continuously keeping the shoulders and arms high causes strain. The shoulders should always remain relaxed during work.

**E 7 Posture of wrists and fingers.** The wrist should remain straight and in line with the arm.

**E 8 Posture of head and neck.** The head should be a in a natural and central position.

**E 9 Posture of legs**. It should be possible to support both legs on the floor. Working on the knees or while squatting causes strain.

**E 10 Continuous sitting or standing**. Continual sitting causes fatigue and muscle tension. This can be reduced by diversifying the work, taking breaks and exercising. The strain caused by standing work can also be reduced by the use of standing supports, the correct working height and a flexible standing platform.

**E 11 Climbing and moving from one level to another.** Moving on different levels and from one level to another increases physical strain. Walkways must be intact, free of barriers and sufficiently wide. Repetitive climbing (e.g. into machines) also increases the strain on joints.

**E 12 Work breaks and pace of work.** Employees should have the possibility themselves to adjust the physical strain of their by taking breaks. The more exacting and strenuous a job is, the greater the need for breaks.

**E 13 Constantly repeated movements.** Work-related physical movements should be diverse and adjustable by the employee. Constantly repeated movements cause fatigue, muscle tension and stress injuries.

**E 14 Lifting, transferring or carrying with the hands.** Lifting, transferring or carrying a load with the hands is hard work. The resulting strain depends on the size, shape and position of the load, the number of lifting movements and the working environment. The strain can be reduced by means of good planning and the use of lifting accessories. Objects that are too large, too heavy, awkwardly shaped, unstable or dangerous in terms of their composition or contents can cause hazardous strain to employees during handling. (Government Decision 1409/1993)

**E 15 Usability of tools, machinery and devices.** The tools, machinery and equipment used at work should be suitable for the work and for the working conditions. They should be used only for those jobs and for those conditions for which they are suited. A difficult function in a tool or inappropriate placement of the control devices for machinery can cause strain. Service work often has to be performed in difficult working positions, meaning that serviceability factors must also be taken into consideration during procurement.

## Estimating risk levels

The level of risk due to work methods, tools and the working environment can be estimated by examining the frequency of physical strain situations and the nature of the effects.

Table 14. Estimating the level of risk due to physical strain.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Severity of harm |  |
| Likelihood | Slightly harmful  Discomfort, irritation, temporary strain | Harmful  Extended serious effects, permanent minor harm, occasional absences | Extremely harmful  Permanent serious effects, long or repetitive absences |
| Unlikely  Occasional strain; occurs seldom | **1 Very low risk** | **2 Low risk** | **3 Medium risk** |
| Likely  Daily hazardous or straining situations | **2 Low risk** | **3 Medium risk** | **4 High** **risk** |
| Very likely  Continuous hazardous or straining situations | **3 Medium**  **risk** | **4 High risk** | **5 Very high**  **risk** |

**Example:** Final product inspection and sorting occurs on the conveyor belt. Workers on the line work in 45-minute periods for 7 hours every day. What is the risk level of constantly repeated movements?

|  |  |
| --- | --- |
| **Hazard:** | Constantly repeated movements |
| **Description of hazard:** | Repeated movements of the arms and wrists, stress injuries and fatigue |
| **Severity of harm:** | Harmful (pains, absences, slowing of work pace) |
| **Likelihood:** | Very likely (integral part of the work, has an effect all the time) |
| **Risk:** | 4 |

## Actions to control risks caused by physical strain

A well laid-out and organised workstation helps to decrease the risks arising from physical strain. The use of lifting accessories and correct lifting methods reduces the strain involved in heavy lifting. By using accessories, diversifying the work and tasks, and properly timed breaks can reduce the strain involved in heavy, repetitive work movements.

# Chemical and biological hazards (C, B)

## Items on the checklists

Chemical hazards refer to health hazards caused by hazardous substances, compounds and particles. The chemical hazards checklist allows a preliminary survey to be made of the need for more detailed measurements and the need for an assessment of chemical hazards. Occupational health care expertise can also be used when evaluating health risks with regard to chemical and biological hazards. Measurements must be made if the employees' exposure cannot be reliably assessed and occupational hygiene measurements have not been made at the workplace.

Risk assessment includes chemical exposure agents present at the workplace and identification of their hazardous properties. Hazardous properties are identified from the valid safety data sheets and package labels. The safety data bulletin contains the hazard and precautionary statements (H and P statements). The hazard statement code numbers H200–H299 are related to physical hazards, H300–H399 to health hazards and H400–H499 to environmental hazards.

The chemical legislation has been amended recently with regard to chemical registration, evaluation, authorisation and restriction in order to comply with the EU Regulation (REACH) (1907/2006). The EU's new CLP Regulation concerning the classification, labelling and packaging of hazardous chemicals took effect on 20 January 2009. The regulation has changed the classification (1272/2008) and labelling of all chemicals. The transition period ended on 1 June 2015. The competent authority for the CLP Regulation in Finland is the Finnish Safety and Chemicals and Agency (Tukes).

Exposure to biological agents can occur in many different working environments, such as agriculture, waste processing, energy production, health care, and the wood processing industry. Exposure can happen by inhalation, the digestive tract or through the skin. Section 40 of the Occupational Safety and Health Act requires that employees’ exposure to biological agents that cause hazards or risks to safety or health shall be reduced to such a level that no hazard or risk from these agents is caused to the employees’ safety or health or reproductive health. The [Government Decision on the Protection of Employees from Work-related Hazards Caused by Biological Agents](http://www.finlex.fi/fi/laki/alkup/1993/19931155) (1155/1993) has been issued under the Occupational Safety and Health Act. Also valid are the [Ministry of Health and Social Affairs Decision on the Classification of Biological Agents](http://www.finlex.fi/fi/laki/alkup/2010/20100921) (921/2010) and, in relation to blood exposure accidents, the Government Decree on the Prevention of Accidents Caused by Sharp Instruments in the Health Care Sector (317/2013).

**C 1 List of chemicals.** The employer must compile a list of the chemicals used at the workplace according to their trade name. The list of chemicals must include at least the following information about the chemicals: the trade names of the chemical, the hazard classification (hazard statements, hazard categories and warnings) and the date of the safety data sheet (information about the location of the safety data sheet is also recommended). The list of chemicals must be posted in a location visible to the employees.

**C 2 Labelling of chemical packages.** Employers have a responsibility to ensure that, when they receive hazardous chemical packages, they have appropriate, clear and permanent labels (Finnish, Swedish). Storage tanks must also be labelled.

**C 3 Safety data sheets.** The employer must keep up-to-date safety data sheets at the workplace. The safety data sheets must be also be available to employees during disturbances e.g. a power failure.

**C 4 Methods of using chemicals.** Chemicals must be used in such a way that their use does not cause a hazard to the health and safety of employees. Employee exposure to the chemicals must be investigated so that the hazards they cause can be assessed and the necessary actions taken.

**C 5 Storage of chemicals.** Chemicals must be stored at the workplace in a safe manner with consideration to chemicals that react with each other. Chemical stores must be labelled clearly. The applicable special instructions must be observed when storing flammable and explosive chemicals.

**C 6 Disposal of chemical waste.** Chemicals must be disposed of in such a way that they do not cause a hazard to people or the environment and which complies with the waste management legislation.

**C 7 Hazardous or harmful chemicals.** Employee exposures to hazardous or harmful chemical agents must be restricted to such an extent that they pose no threat to employee health or safety. Alternative substances and methods must also be considered in order to reduce exposure. The employer must have adequate information about the properties and dangers of the chemical agents used. The quantity and nature of employee exposures to chemical agents must be investigated so that an assessment can be made of the health hazards and the necessary actions can be taken. (Government Decree 715/2001)

**C 8 Chemicals that are carcinogenic, mutagenic and toxic to reproduction.** Chemicals that cause cancer, gene damage and are toxic to reproduction are called CMR substances. Such substances can be identified by the hazard statements and warning symbols on the safety data sheet. All activities that involve a risk of exposure to the above-mentioned agents must be assessed with regard to the nature, quantity and duration of employee exposure. The employer must maintain a list of carcinogenic exposure agents and the employees that are exposed to cancer-causing work methods or substances. The names of the exposed employees must be reported to the Finnish Register of Workers Exposed to Carcinogens (the ASA register). The assessment of exposures is a job for experts.

**C 9 Allergy-causing chemicals.** This refers to the exposure of employees to chemicals by way of inhalation that causes asthma, allergic colds or other over-sensitive reactions, or by way of skin contact that causes skin sensitising. The harm is usually permanent. The assessment of exposures is a job for experts.

**C 10 Flammable or explosive substances.** Utmost caution must be observed when handling and storing explosive, flammable, corrosive or other such hazardous substances. The ATEX legislation applies to spaces that are potentially explosive, working in them and the equipment used in them. (Government Decree 576/2003)

**C 11 Dust and fibre.** Dust consists of solid particles floating in the air and is generally created by a mechanical process or by mixing. Fibre refers to the mineral fibres used in industry (e.g. textile dust) or to synthetic, inorganic fibres (e.g. glass or mineral wool). Dust and fibres irritate the skin, eyes and breathing organs, which means that exposure must be prevented/minimised. Dust-air mixtures can also cause an explosion hazard.

**C 12 Gases.** Gases refer to all gaseous substances at the workplace that are harmful to health and safety.

**C 13 Vapour, fume and smoke.** Vapour arises during the evaporation of a liquid substance into the air (e.g. solvent vapour). Fumes arise when machining solid material in hot processes (e.g. welding fumes). Smoke comprises solid particles floating in the air after burning (e.g. oil smoke).

**C 15 Combined effects of exposure agents.** In addition to the actual exposure, the health hazard is affected by magnitude and duration, the characteristics of the person involved and exposure to other factors. The combined effect can be additive or potentiating. For example, exposure to organic solvents and noise increases hearing damage. The assessment of exposures is a job for experts.

B 1 Bacteria and viruses. At workplaces with an infection risk (e.g. health care facilities), the nature, duration and magnitude of employee exposure must be estimated. Bacteria and viruses can cause inflammation, allergies or diseases. The assessment of exposures is a job for experts.

**B 2 Fungi e.g. yeast and mould** At workplaces with a risk of hazardous fungi (yeast and mould) e.g. in agricultural work and waste disposal, the nature, duration and magnitude of employee exposure must be estimated. Fungi can cause allergic diseases (e.g. hypersensitivity pneumonitis) and/or rashes. The assessment of exposures is a job for experts.

**B 3 Protozoa, parasites, insects.** Increased travelling can cause exposure to various insects (e.g. tropical insects) and the diseases they spread. Working outdoors can also expose employees to e.g. ticks and bee stings. The working environment can also contain a variety of parasites, such as lice or pinworms, that need a human body to survive but are seldom dangerous to their host.

## Estimating risk levels

The limit values defined for each exposure or the concentrations of impurities in workplace air known to be hazardous (HTP value) should be used as an aid in estimating the health risk due to air impurities. On the other hand, the risk due to exposures to biological and chemical agents can be estimated on the basis of exposure-specific research data, exposure information (e.g. duration, via inhalation and/or the skin) and health information.

Table 15. Estimating the level of risk due to chemical hazards.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Severity of harm |  |
| Likelihood | Slightly harmful  Discomfort, irritation, temporary minor illness  Hazard statements  EUH066, H302, H312, H315, H319, H332, H335, H336 | Harmful  Burns, extended serious effects, permanent minor harm  Hazard statements  H301, H311, H314, H317, H331, H341, H351, H361d, H361f, H362, H371, H372, H373 | Extremely harmful  Occupational cancer, asthma, permanent serious effects, life-shortening diseases  Hazard statements  H300, H304, H310, H314, H318, H330, H334, H340, H350, H350i, H360D,  H360F, H370 |
| Unlikely  Chemicals are handled seldom. Concentrations are small. | **1 Very low risk** | **2 Low risk** | **3 Medium risk** |
| Likely  Chemicals are handled often. Concentrations are moderate. | **2 Low risk** | **3 Medium risk** | **4 High** **risk** |
| Very likely  Chemicals are handled a lot. Concentrations are large. Symptoms have appeared. | **3 Medium risk** | **4 High** **risk** | **5 Very high risk** |

**Example:** A silk screen printer is continuously exposed to solvent agents at work. The combined concentration of solvents in the air has been estimated to vary between 50% and 100% of the HTP value (concentration of impurities in workplace air known to be hazardous). What is the risk due to the solvent agents?

|  |  |
| --- | --- |
| **Hazard:** | Flammable and explosive substances, printing ink and  solvent fumes |
| **Description of hazard:** | 1. Solvent substances, a health hazard when inhaled,  evaporate from the printing ink. 2. Printing ink causes skin complaints if there is contact. 3. Solvent fumes can combust and cause a fire. |
| **Severity of harm:** | 1. Harmful (irritation, temporary nervous system effects, and permanent nervous system effects from long-term exposures over the HTP value). 2. Slightly harmful 3. Extremely harmful |
| **Likelihood:** | 1. Likely 2. Very likely 3. Likely |
| **Risk:** | 1. Solvent fumes 3 2. Rashes 3 3. Combustion 4 |

## Actions to control chemical risks

The following actions may be used, as appropriate, to prevent chemical and biological risks:

1. Selection and introduction of chemicals, working methods and practices that cause no hazards or as few hazards as possible
2. Implementation of sufficient internal control in the workplace
3. Reduction in the number of people exposed and in the exposure period
4. Technical prevention and control measures
5. Personal protective equipment and protective clothing
6. General occupational hygiene measures
7. Training and guidance
8. Use of warning and safety signs
9. Monitoring of employee health status
10. Planning of emergency and first aid actions
11. Other necessary actions

# Psychosocial stress (P)

## Items on the checklists

Psychosocial stress refer to factors related to work content, work organisation and arrangements, and the social functioning of the workplace community that can cause harmful stress for an employee. When they are inadequately controlled, continue for a long time or occur in unfavourable conditions, psychosocial stress factors can cause a health hazard for employees and contribute to harm resulting from other hazards.

Psychosocial stress is part of the total stress caused by work, and is an integral part of the overall assessment of risks. The checklist includes the generally known stress factors. Some of the stress factors are common to all workplaces while others are more typically encountered in certain sectors or jobs.

The management-related factors that cause stress can be e.g. poor management methods, excessive absence by the supervisor, the management style, management that is perceived as unfair, or a neglect of management obligations.

**P 1 Repetitive or monotonous work.** Work that is constantly repeated, monotonous or lacks variety leads to boredom and decreased vitality. Work in which employees are unable to diversely use their professional skills and other abilities and develop themselves can be stressful.

**P 2 Qualitative expectations for work.** Certain qualitative expectations, such as reasoning, problem-solving or decision-making situation that are too difficult or very broad and diverse duties can be stressful. The expectations must be properly set in relation to the employee's resources, abilities and skills and their possibility to influence the work.

**P 3 Responsibility of work.** The responsibility involved in the work can e.g. be responsibility for the safety or health of other people or responsibility for financial matters. The responsibility of work can have a harmful impact when it is not in balance with decision-making authority and the available resources.

**P 4 Constant state of alertness.** A constant state of alertness when working can lead to fatigue and a loss of concentration. The negative effects can occur, for example, when working in a control room, in health care and in transportation.

**P 5 Processing information.** An excessive amount of information or assimilating constantly changing information is a challenge for a person's cognitive operating capacity (memory, attention and learning ability). An excessive and badly managed flood of information can threaten the feeling of job control and cause psychological stress, errors and a drop in performance.

**P 6 Interruptions in work.** Smooth working can be interrupted by noise, speech, something other matter or task, which takes the employee's attention away from the task at hand. Constant interruptions make it difficult to concentrate, complete tasks and achieve a good end result.

**P 7** **Interaction situations required by duties.** Repetitive difficult interaction situations in work can lead to emotional stress and complicate recovery from work in e.g. the social welfare, health care and education sectors and in various customer service positions. Harmful stress can occur if the negative feelings caused by the interaction situations cannot be constructively processed in the workplace community or, for example, via supervision.

**P 8 Threat of violence.** Workplace violence refers to perceived physical violence or the threat of   
violence while engaged in normal work. It can arise at the workplace or employees can be threatened outside the workplace (violent customers, patients, etc.).

**P 9 Division of work, job description and goals.** Harmful stress can occur if employees are not clear about what is included in their job description, what the goals of the work are and how their work is related to the whole organisation. Conflicting goals, tasks or expectations as well as various change situation can also cause harmful stress.

**P 10 Possibilities to influence work** Harmful stress can occur if the employees are unable to influence things like the pace of work or working order. The possibilities to influence also refer to employees' possibility to select different methods of completing their own work.

**P 11 Workload and pace of work.** If the workload or pace of work exceeds the employees' resources to handle them, work piles up, extraordinary situations (absences, holidays, ad hoc tasks) cause stress, deadlines are missed or work has to be done at a poor quality level or a lower level of safety. If it continues for an extended period and without adequate recovery time, a heavy workload, time pressure or fast pace of work can be harmful to the health and safety of the employee. A workload that is too small can also cause harmful stress.

**P 12 Working hours (incl. overtime, shift work, night work and commitment of work)** Depending on the nature of the work, harmful stress can be caused by e.g. the length of working days, repeated consecutive shifts and rotation, the time of completing the work, unpredictable working hours, stress due to the commitment required by work, and the lack of adequate recovery time after and between working days.

**P 13 Mobile work.** Mobile work refers to the possibilities that ICT technology tools provide for performing work in a manner that is independent of time and place. Stress can be caused by e.g. changing physical and social operating environments, blurring of the line between work and leisure time, the time required for travelling and working across time zones.

**P 14 Uncertainty of employment.** Employment for a fixed term or fixed task, changes in the employment contract, or a threat of discontinuation of employment can be a source of stress for employees.

**P 15 Working conditions and tools.** Shortcomings in the physical working environment can cause harmful stress e.g. noise if the work requires concentration or communication, the fear of exposure to mould or virus , or a feeling of insecurity in sectors susceptible to accidents. Computer programs that are difficult to use or continuous telecommunications problems can also cause stress.

**P 16 Working alone.** Working alone occurs when employees work alone, or if they work on night shifts, for example, and feel isolated due to noise, walls or other reasons. Working alone may involve excessive responsibility, information flow problems, the threat of violence and an increased risk of accident.

**P 17 Support from supervisor and workplace community.** Supervisor and workplace community support refers to informational support (advice, suggestions and re-assessments), material support (practical help), respect (providing positive feedback on another person's work and capabilities), and mental support (a willingness to help, confidentiality, empathy, listening and encouragement). The absence or a lack of support has a negative impact on employee well-being.

**P 18 Cooperation and information flow.** Poorly functioning cooperation between employees and the supervisor and between employees complicates work and affects employee well-being. This can be a matter of too little cooperation or cooperation that is too formal. Information flow comprises not only communication with employees about issues related to work, the workplace environment and the company but also the provision of feedback among employees and between employees and supervisors. Information flow challenges are particularly likely to occur in change situations, multicultural workplace communities, and when working in a foreign language.

**P 19 Harassment and inappropriate treatment.** Harassment and inappropriate treatment are e.g. cruel and suggestive messages, disparaging and mocking speech, continuous groundless criticism and hindering of work, ostracising from the workplace community, repeated threats, and sexual harassment.

**P 20 Discrimination.** Discrimination means the unequal treatment of an employee based on e.g. gender, age, nationality, religion, health status or some other factor related to the person. Discrimination can occur between a supervisor and an employee or between employees. Repetitive or continuous inconsistent or unequal treatment can also cause stress.

## Estimating risk levels

The risks arising from excessive or low psychosocial stress can be estimated by examining the frequency of exposure to stressful situations and the resulting harm.

**Table 16.** Estimating the level of risk due to psychosocial stress.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Severity of harm |  |
| Likelihood | Slightly harmful  Fatigue and frustration, occasional absences | Harmful  Lowered ability to concentrate and act, helplessness and  restlessness, repeated absences | Extremely harmful  Hopelessness, extreme depression, continuous absences |
| Unlikely  Hazardous or stressful situations occur seldom or a little at a time. | **1 Very low risk** | **2 Low risk** | **3 Medium risk** |
| Likely  Hazardous or stressful situations occur repeatedly or for a certain period at a time. | **2 Low risk** | **3 Medium risk** | **4 High** **risk** |
| Very likely  Hazardous or stressful situations occur continuously, with harmful  effects. Permanent stress. | **3 Medium**  **risk** | **4 High** **risk** | **5 Very high risk** |

**Example:** The amount of work done by an assembly team has increased substantially during half a year, resulting in continuous overtime. The working atmosphere and team spirit is perceived as poor. What is the level of risk caused by this problem?

|  |  |
| --- | --- |
| **Hazard:** | Too high expectations or goals |
| **Description of hazard:** | Amount of work cannot be handled in normal working hours, continuous overtime. |
| **Severity of harm:** | Harmful (decreased motivation, poor working atmosphere) |
| **Likelihood:** | Likely (situation continued for 6 months) |
| **Risk:** | 3 |

## Actions to control risks caused by psychosocial stress

The same consistent and systematic methods that are used with other workplace hazards can be utilised to intervene in psychosocial stress factors.

The employer's actions can focus on 1. eliminating or reducing the harmful stress factor, 2. offering the employee management methods and 3. creating support practices for employees who experience harmful stress levels.

The harmful effect of stress factors can be effectively prevented by combining different actions. The principle of prevention also applies to psychosocial stress. If the health hazard caused by the stress factor is significant, the actions must primarily target the stress factor.

Depending on the stress factor, elimination of a harmful stress factor can be a matter of e.g. ensuring human resources, clarifying work processes, planning and scaling of work, developing supervisor work, creating communications channels, and ensuring that employees have possibilities to influence their work.

It is not usually possible to eliminate all stress factors, and they are a part of work. However, operating methods should support success with regard to the basic task. The employer must provide employees with methods to control stress factors e.g. training, flexible working hours, pauses, social support, feedback on work, or confirmation of other positive features of their work.

The employer's actions can also target the harmful stress on an employee. Actions to support a stressed employee can include early support operating models and rehabilitation and return to work practices. Occupational health care has a variety of methods for offering individual assistance and support to people who experience stress in their work