

M2-EN.7 IMPACT OF THE WORK

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M2-EN.7.1 Introduction – Ergonomics

Ergonomics mean adjustment of the working conditions and working tools to worker's conditions and needs. Muscleskeleton injuries may be prevented to a great extent if the work is carefully planned and organized. The place of work must be organized; machines and working tools must be chosen so that they fit the work to be carried out and the person who does it. Today it is possible to get ergonomic elaborated tools, hand tools and other good technical facilities which increase safety, reduce the harmful impact and not least increase the quality and the efficiency.

In the construction sector, heavy lifts, inconvenient working postures and one-sided repeated work are the impacts, which are most frequently stated as the reason for the musculoskeletal diseases and injuries.

In this chapter, several working conditions are described, which are typical for the construction sector. The impact of these conditions on the health and safety of the worker is described and safety measures are suggested.

Risk Factors

- Inconvenient and heavy lifting, pulling and pushing: If the load is sudden and heavy the work implies a particular risk.
- Inconvenient working postures
- Cold, draught, vibrations etc. may intensify the impact

Impact on Human Health

- Diseases in the muscles, tendons and joints – the back is particularly exposed
- Infiltration and myositis of neck and shoulders
- Osteoarthritis, circulatory diseases, tenosynovitis

M2-EN7.2 Manual Operations

Manual operation means lifting, carrying, tipping, pushing and pulling which are carried out using muscular strength. Tasks which include manual operation must always be taken into serious consideration. Manual operation which includes a risk must always be avoided by organizing the work or using technical facilities. If this is not possible other effective preparations must be made.

Risk Factors

- Even light burdens may include a risk if the lift is one-sided, with one hand, in cramped places, on an uneven or smooth foundation or on ladders or stairways
- Worsening factors may e.g. be unhandy burdens, distorted working postures and sudden unexpected loads

Impact on Human Health

- Back injuries from heavy or incorrect lifting
- Fall or lack of balance may cause acute injuries
- Repeated minor damages may lead to a risk of attrition over a longer period

Safety Measures

- Make sure that the working area is tidy and that the foundation is cleared and safe to stand/walk upon
- Use the correct lifting technique
- Avoid carrying heavy burdens on ladders and stairways. Use technical facilities instead

M2-EN.7.3 Physically Hard Working Postures and Movements

Physically hard working postures are often due to badly organized work places or a working area placed too high or too low. Physically hard working postures may also be due to the use of incorrect elaborated tools or faulty working equipment according to the task and the person.

Risk Factors

- Inflexible work, lying, kneeling or other awkward working postures
- Heavy work
- There are particular risks from physically hard monotonous work

Impact on Human Health

- Muscles and joints are exposed to grind
- There is a strain on the circulation
- Oedema in the legs
- One-sided and repeated physically hard work is very tiring. Monotonous work may affect the muscles and the circulation system and may cause mental distress
- The risk is increased when several kinds of impact are combined, e.g. digging with a shovel

Safety Measures

- Organize the work and the work place in a way so that physically hard working postures as far as possible are avoided
- Organize the work so that one-sided repeated work, as far as possible, is avoided, and make sure that there is an opportunity for changing between the work tasks
- Use knee protection, pillows and stools to support the body. Make sure that the circulation is not hampered during the work
- Do change the working posture frequently
- If the worker must walk and work at the same time, the tools and means of transportation must be of adequate size in order to carry out the work in an upright position

M2-EN.7.4 Mental Stress

In the construction sector mental stress is often experienced in connection with pressure of time, working at a high rate, noise, weather conditions (very high or very low temperatures), contradictory demands, no influence in the organization of one's own work, solitary work, and bullying or harassment. Mental stress leads to a generally depreciated working climate.

Risk Factors

- Piecework may lead to an elevated working rate and cause stress, tiredness and inattention. Risk of accidents

- The demands for quality are not adjusted to the demands for use of time

Impact on Human Health

- Mental tiredness, lack of energy, headache, insomnia, anxiety, low self-confidence
- A long term impact may lead to stress, depression, gastric ulcer or cardiovascular diseases
- A person suffering from stress will have a higher risk of making an error that may cause an accident

Safety Measures

- Avoid jobs based upon time performance
- Make sure that the work is organized in a way that prevents frustrations and negative mental experiences
- Use special questionnaires to define the problems
- Take organisation measures
- Use special qualifications of each worker
- Motivate workers

For further information of mental stress, refer to section M0-EN.8.

M2-EN.7.5 Noise

Exposure to continuous din above 75-80 PNdB implies a risk of permanent hearing disability. Impulsive noise with a peak value above 130-140 PNdB may injure the hearing even at very few incidents of impact.

Hearing protectors to be used when there is not any possibility for further reduction by technical measures as a single measure only under exceptional circumstances.

Risk Factors

- The risk of permanent hearing disability depends on the power and duration of the din
- Brief but powerful din may also cause permanent injuries
- Increase of accident rate due to poor communication
- Din may also cause stress

Impact on Human Health

- Tinnitus and abnormal hypersensitivity to sound
- Permanent hearing disability caused by din is a chronic injury in the internal ear
- Din may lead to elevated pulse and blood pressure which over a longer period of time is harmful for the organism

Safety Measures

- Avoid unnecessary din – also when the limit values are not exceeded

- Turn off equipment that is not in use
- Select low noise machines-tools
- Apply shock absorbers to noisy machines etc.
- Use hearing protector if the noise cannot be avoided. Remember that even the best protector almost does not protect at all if it is removed from time to time – even shortly

For further information of mental stress, refer to section M0-EN.5.

M2-EN.7.6 Vibration

M2-EN.7.6.1 Hand and Arm Vibration

The impact from vibrations should be reduced to below 130 PNdB. Even this should be reduced which can be done by simple measures. It is the employer's responsibility to lower the vibration.

Risk Factors

- The risk of injuries caused by vibrations depends on the power and duration of the impact
- Risk of accidents due to attack of numbness or white fingers

Impact on Human Health

- Buzzing or numb fingers
- Impact during a long period of time may lead to white fingers
- Permanent reduced tactile sense and ability to grasp. A permanent buzzing in the fingers, ache in the shoulders and joints and increased risk of osteoarthritis

Safety Measures

- Select proper machines-tools
- Stop working if the fingers start to buzz or become numb
- Find other working methods
- Be aware of the fact that gloves only lower high-frequency vibrations. The risk of white fingers is not reduced by using gloves

M2-EN.7.6.2 Whole-body Vibrations

Whole-body vibrations are the term for the impact which all of the body is exposed to when a person stands, sits or lies on a vibrating foundation. High vibration power and a long-term duration of the impact increase the risk of injuries while periods of rest reduce the risk.

Fixed working postures and frequent twists in the back, increase the risk of injuries. So do tired muscles or when the back is pushed together after hard physical work. Jolts and unexpected movements which are caused by e.g. an uneven foundation or smaller collisions also increase the risk.

Unnecessary vibrations must be avoided.

Risk Factors

- The driver of cranes and contractor machines are particular at risk

Impact on Human Health

- Risk of problems with the back, pains across the loins, ruptured disc and early degeneration of the vertebral column

Safety Measures

- Level the road, avoid solid wheels and vehicles without suspension
- Choose seats with possibility for adjusting the seat according to the weight of the driver

M2-EN.7.8 Weather conditions

M2-EN.7.8.1 Cold

When cooling down the tactile sense is diminished and so is the ability to do a precisely done job. This increases the risk of accidents.

Risk Factors

- Lying, kneeling or sitting work with direct contact with cold or moist surfaces increase the risk of cooling down

Impact on Human Health

- Cooling down has a negative impact on the circulation and the metabolism
- Cooling down leads to increased risk of local overloading of the muscular structure

Safety Measures

- Use adequate work clothes and reduce the time for working
- Use a suitable mat if the work is carried out lying, sitting or kneeling

M2-EN.7.8.2 Heat

Powerful heat radiation from the sun combined with a high atmospheric humidity may be hard, especially for elderly people.

Risk Factors

- There is a particular risk at heavy work at warm machines under the sun, e.g. asphaltting, for people working on scaffolds
- Protective clothes keeps in the heat

Impact on Human Health

- Fluid loss, high temperatures,

Safety Measures

- Avoid exposure to direct sun shine when temperature and humidity is high
- Provide workers with cool water
- Wear suitable light working clothes
- Do interrupt the work with frequent breaks in surroundings not that warm

M2-EN.7.10 Illumination

- Insufficient illumination - i.e. not enough, too much or incorrectly placed – may lead to bad working conditions concerning the sight.

Risk Factors

- Increased risk of falling and other accidents
- It may be the occasion of fixed and awkward working postures

Impact on Human Health

- Exertion of the eyes, pain in the eyes, headache, muscular tension in the neck and the shoulders

Safety Measures

- Make sure that the access roads, transportation roads and areas with traffic at any time are illuminated with at least 25 lux at ground level, floor level or scaffolding level
- Make sure the work place have adequate illumination
- Bar unlighted areas where there might be a risk of falling etc.