

## **M5-EN.7. RISK FACTORS RELATED WITH WORKING ENVIRONMENT**

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### **Short description of the section:**

In this section examples of typical risk factors present in the working environment of a driver of a land transportation company are presented and analyzed.

The **goal** of this section is:

- Present the notion of **microclimate** **##G14##**;
- Distinguish the types of risk factors present in the working environment of a driver of a land transportation company;
- Present forms of manifestation of these risk factors and describe them;
- Distinguish the adverse effect of risk factors on human health; and
- Give recommendations for work safety measures.

Material of this section will assist the employee, the employer and the company owner in adjusting recommendations for determining risk factors related with working environment, ways of prevention and safety measures for himself and his company.

### **M5-EN.7.1. Microclimate (M5.7.1.1.jpg)**

#### **M5-EN.7.1.1. Notion**

**Microclimate** of working environment can be classified into the following areas:

- Cold area;
- Thermally neutral microclimate, comfortable, endurable area;
- Warm and hot area.

Microclimate in premises is defined and assessed on the basis of the following four **parameters of thermal effect**:

- Air temperature;
- Relative humidity;

- Air flow velocity;
- Thermal radiation.

However, every individual workplace should be analyzed according to work intensity/activity, clothing, acclimatization, health status etc.

These four microclimate parameters of different intensity each separately and in complex influence human beings. The following **levels of climate sensation** can be distinguished:

- Comfortable level;
- Endurable level;
- Unbearable level.

**In the comfortable level** all parameters are balanced; human beings do not face any climate related difficulties or hazards.

**In the endurable level** a human being must fill the gaps to reach the thermal balance (internal heat production, extended welding processes). These internal body adjustment actions are related with more intensive metabolism and increased consumption of energy; they can be bearable without any adverse outcome only to some extent. Therefore, every now and then breaks should be made for cooling or warming-up or for supplying with personal protective equipment.

#### **M5-EN.7.1.2. Risk factors**

In the assessment of **microclimate** manifestation in the workplace the following shall be **inspected and identified**:

- Is it possible to regulate the temperature of the driver's passengers' space within thermal comfort range?

When microclimate balances on the level of unbearable cold the adverse effect on human being manifests in the following ways:

- Hood health condition deteriorates;
- Mobility, sensibility and agility becomes limited due to slower blood circulation in the exposure to cold and the risk of incidents increases respectively;
- Body tissues are damaged (frostbites of different degrees);
- General freezing of the body, in extreme cases the body temperature falls dramatically to the state of unconsciousness.

When microclimate balances on the level of unbearable heat (cold:

- The productivity is lower;
- The number of mistakes goes up;
- Features of distress and fatigue are felt;
- Risk of incidents increase.

Exposure to high temperature influences heart and blood circulation system, breathing disorders and disturbed water and electrolytes balance. In extreme cases heat caused illnesses may manifest (heat twists and heat strokes).

Microclimate parameters in working environment are laid down in Hygiene Norm HN 69: 2003 “Thermal comfort and adequate thermal environment in working premises”. The limit values of parameters and measuring requirements are approved by the Decree No.V-770 of 24 December 2003.

### **M5-EN.7.1.3. Safety measures during the exposure to cold**

The following **work safety measures** are recommended in **the exposure to cold**:

- Reduce cold loads; ambient air temperature cannot be lower than required by the technological process;
- Avoid draughts; the air flow velocity shall be maintained as low as possible;
- Install sources of heat (use air-conditioned vehicles);
- Limit frequent changes of workplace microclimate (heated driver cabins);
- Comply with the recommended duration of heat and cold exposure;
- Comply with recommended length of cold and heat exposure;
- Wear appropriate clothing;
- Arrange premises for changing and warming up (21 C, dry, without draughts);
- Provide for warming up breaks;
- Supply with cold resistant clothing and arrange drying facilities.

### **M5-EN.7.1.4. Safety measures during the exposure to heat**

The following **work safety measures** are recommended in **the exposure to heat**:

- Provide for measures to protect from direct sunshine (blinds, light absorbing glazing);
- Install natural ventilation (fans, air showers) in the event of excessive air rotation or high air flow velocity;
- Install air-cooling systems (use air-conditioned vehicles);
- Reduce thermal radiation (covers, safeguarding shields, screen etc.);
- Reduce the amount of work involving groups of bigger muscles (arms, legs and carcass muscles);
- Provide for cooling breaks ;
- Supply personal protective equipment to employees.

## **M5-EN.7.2. Lighting (M5.7.2.1.jpg)**

### **M5-EN.7.2.1. Risk factors**

Adequate **lighting** **##G1##** in the workplace ensures good work results and enables to recognize and avoid risk in a timely manner.

The quality of lighting equipment in the workplace is defined by the **level of lighting**, i.e. by:

- Nominal intensity of lighting subject to type of activity and other features:
  - Evenness of place and time;
  - Distribution of light density and blinding limitations;
  - Light direction and shadows;
  - Light colour and colour reproduction;
  - Amount of day/natural light.

In the assessment of **lighting** the following must be **inspected and identified**:

- Is the vehicle equipped with required lights (fog lights, parking lights)?
- Is lighting equipment regularly maintained?
- Are dimensions of the vehicle clearly discerned in the darkness?
- Is the workplace in the vehicle and at the vehicle sufficiently illuminated (not too dark, no sources of dazzling)?
- Do all indicators function?
- Are all necessary indicators installed?
- Are indicators sufficiently bright, not blinking or dazzling?
- Are figures on the panel of appropriate size, contrast and brightness?

### **M5-EN.7.2.2. Safety measures**

The following **work safety measures** are recommended to ensure proper **lighting**:

- Use high quality lighting system;
- Install additional high and low beam lights and fog lamps;
- Provide regular maintenance;
- Mark the vehicle's contour with contrast or reflective film;
- Ensure sufficient natural illumination and survey;
- Provide for effective protection from direct sunlight, blazing and heat radiation;
- Supply with additional "working lamps" (e.g. for reading of maps);
- Supply with appropriate navigation panels, replace inadequate panels.

Limit values of workplace lighting are regulated by hygiene norm HN 98:2000 “Natural and artificial workplace lighting”. Limit values of radiation and general measuring requirements approved by the Decree No.277 of 24 May, 2000:

### **M5-EN.7.3. Need of space and traffic routes (M5.7.3.1.jpg)**

#### **M5-EN.7.3.1. Risk factors**

In the assessment of **need of space and traffic routes** the following must be **inspected and identified**:

- Do vehicles drive only on the roads and in the areas where safe driving conditions are ensured and which have the adequate load capacity?
- Are vehicles driven on slopes (downhill and uphill) only under safe conditions to avoid sliding and turning over?
- Are vehicles parked at pits, ditches and edges within safe distance?
- Are vehicles exposed to danger of moving, falling or turning over in places of dumping or unloading?

#### **M5-EN.7.3.2. Safety measures**

The following **work safety measures** are recommended to **satisfy the need of space and ensure traffic route safety**:

- Plan the route so that safe driving conditions are ensured;
- Maintain safe distance from pits, slopes and edges;
- Provide for and use appropriate size trailers for cargo trucks.

### **M5-EN.7.4. Self-study assignment**

On the basis of information presented in this section draw a list of **risk factors related with working environment** in the typical driver’s workplace in your company **producing multiform physical effect** on a driver in your company.

If the risk factor is defined by standard parameters, name the **regulations** related with the risk factor and **instructions** that have to be complied with.

Choose appropriate **measures (technical, organizational, personal) for elimination of risk factors** and determine whether **additional consultation of specialists** is required. If statutory acts provide for such (e.g., pursuant to legal acts on accident prevention), point that out.

Specify **who is responsible** for implementation of selected measures and when they must be implemented.

Fill in Table 8. You may use the template **##D8##**.

Table 8

**Company:**

**Person in charge:**

**Job:**

**Date:**

<b>Type of work, work equipment, workplace</b>	<b>Risk factors/ shortcomings/ loads (factor)</b>	<b>Factor related explanations and references</b>	<b>Regulations and working instructions</b>	<b>Measures: Technical, Organizational, Personal</b>	<b>Implementation (who) (when)</b>