M5-EN.5. BIOLOGICAL, FIRE, EXPLOSION AND THERMAL RISK FACTORS

M5.jpg

Short description of the section:

In this section examples of typical **biological** **##G2##**, **fire** **##G11##** and **explosion** **##G27##** and **thermal** **##G30##** risk factors that a driver of a land transportation company is subject to are presented and analyzed.

The **goal** of this section is:

- Distinguish the most specific types of biological, fire and explosion risk factors that a driver of a land transportation company is subject to;
- Present forms of manifestation of these risk factors and describe them;
- Give recommendations for safety measures.

Material of this section will assist the employee, the employer and the company owner in adjusting recommendations for determining biological, fire and explosion risk factors, ways of prevention and safety measures for himself and his company.

M5-EN.5.1. Biological risk factors and safety measures

Biological risk factor encountered in a typical driver's workplace in land transportation sector is a hazard of infection caused by micro organisms and viruses.

Therefore in the assessment of the manifestation of **biological risk factor** the following shall be **inspected and identified**:

- Is accumulation of spores and fungi in air conditioning equipment prevented?
- Are air-conditioning equipment used as designated?

The following **safety measures** are recommended to avoid adverse effect of biological risk factors:

- Regular maintenance of filtration equipment (cleaning and replacing);
- Compliance with the owner's manual supplied by the vehicle's manufacturer;
- Washing with disinfectants when ripe smell is released from heat circulation system

M5-EN.5.2. Fire and explosion hazard (M5.5.2.1.jpg)

M5-EN.5.2.1. Risk factors

In the assessment of the manifestation of **fire and explosion risk factor** the following shall be **inspected and identified**:

- Is absence of the source of ignition guaranteed when the vehicle enters fire or explosion hazardous zones?
- Is there awareness that a very explosive oxygen and hydrogen mixture is released during battery charging?
- Are operation requirements for gas driven vehicles observed?
- Is oily mud removed from the vehicle‘s engine or crankcase?
- Are standby (reserve) containers safely fixed?
- Is the allowed number of standby (reserve) containers carried along?
- Are containers with flammable liquids and gas transported in a safe manner?
- Is the engine switched off and are other sources of flame removed while refuelling the vehicle?
- Is smoking prohibition while refuelling the vehicle observed (also while filling diesel fuel in winter)?
- Are cloths used for oil and fuel mopping discarded or kept away from the engine?
- Is fuel contaminated clothing changed immediately?
- Are electric appliances taken on the trip (e.g. cable spools, drills, coffee-makers, portable TV sets) not used in explosive environment?
- Is there electric shock hazard?

M5-EN.5.2.2. Safety measures

The following **safety measures** are recommended to avoid negative effect of **fire and explosion risk factor:**

- Coordinate operation in fire or explosion hazardous zones;
- Park the vehicle only above ground;
- Maintain adequate distances from inspection pits;
- Park only in garages with adequate ventilation (with draught);
- Supply with gas extinguishes and control their validity time;
- Keep the vehicle’s engine and crankcase clean of oily dirt;

– Standby (reserve) containers are allowed; if possible, standby containers should be abandoned;
– Ensure loading safety;
– Ensure sufficient ventilation or use warning signs;
– Observe limitations of container amounts;
– Comply with vehicle refuelling safety rules;
– Keep cloths used for oil and fuel mopping away from the engine;
– Monitor or prohibit the use of electric appliances in explosive environment;
– In the event of electric shock hazard eliminate the difference between potentials.

M5-EN.5.3. Thermal risk factors

M5-EN.5.3.1. Contact with hot substances (M5.5.3.1.jpg)

In the assessment of the manifestation of contact with hot substances the following shall be **inspected and identified**:

– Is prevention of any contact with hot surface of metal parts (e.g. engine, exhaust system) or liquids (e.g. cooling liquids), during service or inspection ensured?

Effect on human health. Contact with hot solid, liquid or gaseous substances may cause burns or scalds. The degree of burns or scalds depends on the surface temperature of hot substances, duration of the contact, type of surface layer of the substance, part of the human body that is exposed to the hazard, area of affected body surface, suitability of used personal protective equipment.

The allowable levels of contact with hot substances are defined in the standard LST EN 563 + AC + A1 2000: Machinery safety, temperature of contacted surfaces, and ergonomic data for determining limit values of hot surfaces temperature.

M5-EN.5.3.2. Safety measures

The following **safety measures** are recommended to avoid or reduce the adverse effect of **contact with hot substances**:

– Reduce surface temperature (e.g. by cooling components of the drive), insulate;
– Fence and enclose hazardous zones;
– Lessen contact while working on the surface;
– Use adequate working tools and equipment (e.g. by choosing handles);
– Mark out hazardous zones by installing warning labels, optical and acoustic warning signals;
– Prepare instruction and regulations, train the staff;
– Use personal protective equipment (e.g. safety gloves);

– If possible, use special mechanical shops.

M5-EN.5.3.3. Contact with cold substances, safety measures (M5.5.3.3.1.jpg)

In the assessment of the manifestation of contact with cold substances the following shall be **inspected and identified**:

– Is prevention of any contact with cold surfaces (products, liquids etc.) ensured?

The **adverse effect** of contact with cold substances is frozen skin in contact area. The degree of chill depends on the surface temperature of cold substances, duration of the contact, type of surface layer of the substance, part of the human body that is exposed to the hazard, area of affected body surface, suitability of used personal protective equipment.

The following **safety measures** are recommended to avoid or reduce the adverse effect of **contact with cold substances**:

– Install heat insulating flooring, workplaces and drivers' seats;

– Fence and enclose hazardous zones;

– Put thermal layer on surfaces for sitting and standing, handles of equipment and tools;

– Use auxiliary measures for loading and transportation of cold products;

– Use appropriate personal protective equipment (Standards LST EN 340: 2004 - 06: Protective clothing. General requirements; LST EN 511: 1995 Cold protection gloves);

– Mark out hazardous zones;

– Install premises for warming up and changing:

  - Pursuant to workplace arrangement regulations temperature in premises must be at least 21 C;
  - Observe the recommended maximal duration of exposure and minimal warming up time.

M5-EN.5.4. Self-study assignment

On the basis of information presented in this section draw a list of biological, fire, explosion and thermal risk factors present in a typical driver's job 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 6. You may use the template **##D6##**.

Table 6

Company:

Person in charge:

Job:
Date:

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