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Identification of physical occupational hazards and proposals for preventive measures at the warehouse keeper's workplace

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SUMMARY

Warehouse keeper is a person responsible in the workplace for receiving goods into the warehouse, storing stored goods, maintaining the identification system adopted and picking and releasing goods from the warehouse. At the time of receipt of goods, he makes a quantitative and qualitative acceptance. It then ensures appropriate storage conditions for the given type of goods and decides on the location of the goods in the storage rooms. The stored goods protect against damage, spoilage, destruction and theft. He is financially responsible for the goods and resources entrusted to him. Depending on the type of goods stored, the conditions prevailing in storage rooms may be onerous (open, closed, above-ground or underground rooms, heated or cooled, ventilated or humidified, etc.). The warehouse keeper usually works in one-shift system, but sometimes the nature of the company requires work in

shifts, day and night, on public holidays. A warehouse keeper is exposed to a wide range of occupational hazards, from physical, chemical, biological and psychosocial. The aim of this work is to identify physical occupational hazards and to propose preventive measures at the warehouse keeper's workplace.

Keywords: occupational hazards, occupational risk assessment, occupational risk management.

PHYSICAL HAZARDS

- **Noise.** The source of noise emission can be working devices being the equipment of the warehouse (trolley, printer, air conditioning) and sounds coming from outside the warehouse. Depending on the severity of the noise exposure, work can result in diseases or damage to the hearing system, chronic fatigue, irritability, concentration problems, headaches. Examples of preventive measures to prevent the effects mentioned above include: limiting the simultaneous operation of noise generating devices, periodic testing and measurements, closing windows during the hours when the greatest industrial and communication noise is emitted outside [1].
- **Dusts.** They may cause effects in the form of respiratory diseases, allergic reactions (dyspnea, coughing, itching). Examples of prevention of their adverse impact are such activities as: ensuring the efficiency of gravity ventilation systems (annual measurements of the correct functioning of ventilation systems), periodic ventilation of storage rooms, cleaning the room at fixed dates, transmission of documents that are not needed in the current work, to the archive [2].
- **Electrical current up to 1 kV.** Possible sources of danger: operation of computer equipment and other office equipment, use of kitchen equipment available in the company's social rooms, operation of equipment with faulty power cords, plugs, sockets, operation of electrical installations that do not provide adequate basic and

additional protection, independent repairs of equipment and installations. Example of preventive measures: prohibition of the use of an unsafe installation (e. g. the use of an unsafe installation). with damaged cable covers), timely testing and measurements of the existing electrical installation systems in terms of protection against electric shock and resistance to earth and insulation (inspection every 5 years), ban on unauthorized connections and repairs to the system, the electrical installation should be serviced only by specialized, authorized companies, whose employees have the required qualifications to perform inspections and measurements, protection of electrical system cables against the possibility of mechanical damage, carrying out daily inspections of devices before their use, not switching on the device in the event of its malfunction, switching off devices that may pose a hazard, informing about noticed faults of direct supervisors or employer, reporting to the service all noticed faults, including damages of circuit breakers and power cables [3].

- **Slipping, tripping, falling on the same plane.** It can be reached due to: improper condition of the surface on the premises of the plant, building, warehouse, dirt, dampness of the warehouse floor as a result of transport of materials from and to the inside (mainly when it rains, snow), blocked passages or lack of their designation, power cables lying in the passages and accesses to the workplace, moving outside the building on an icy, snowy or moist surface, moving on an unknown area such as during business trips or in an area insufficiently lit after dark. It may result in all kinds of: fractures, dislocations, twists, bruises. Prevent slips, trips, falls on the same plane can be prevented through: ensuring proper technical condition of the surface, hard surfaces should be without thresholds, damage to the surface, non-slip surfaces, in case of damage ensure immediate repairs, use of footwear with an anti-slip sole, maintaining order in and around the warehouse, proper storage of materials, laying materials in such a way that they do not protrude, playing on them and falling, cleaning staff is obliged to immediately remove spilled liquids and use anti-slip cleaning agents, marking local hazards, e. g. The building manager is responsible for regular inspections of the building's lighting and replacement of damaged light sources [4].

- **Fall to a lower level.** Possible sources of danger: hurry when moving up stairs, working with stools, platforms, working on a ladder, poor technical condition of ladders and platforms or their incorrect positioning, entering and leaving the means of transport. Consequences of a fall: fractures, dislocations, spinal injuries, bruises. Preventive measures: prohibition to work on removing materials from the upper shelves using chairs, in particular using a chair that is a computer workstation equipment (chairs equipped with wheels), assisting oneself only with objects intended for this purpose (e. g. a chair with wheels), or to take off materials from the upper shelves using chairs. ladder, platform, stool), periodic technical inspection of ladders and platforms, and in case of unsatisfactory technical condition, their withdrawal from use, use of ladders with rubber feet, placing ladders on an appropriately level and hard surface, the use of safety equipment by another person, stairs accessing the workplace should be stable, durable, and steps with anti-slip protection (profiled, made of non-slip materials or protected with special tapes, overlays), handrails should be held while walking on stairs, anti-slip footwear should be used [5].
- **Hitting stationary objects.** Possible sources of danger: permanent structures in the plant and storage room (edges of warehouse furniture, protruding elements of stored materials), narrow entrances, access to stored materials, no designation or obstructed communication routes. Effects: cuts, cut wounds, mild injuries (bruises, tumours, etc.) Methods of prevention: Transport routes must be determined and marked with continuous, clearly visible lanes. As a standard, yellow or white stripes are painted, adjusting them to the colour of the surface. It is the employer's duty to determine the maximum speed at which means of internal transport may travel on the premises. There should be no thresholds or steps on transport routes and in warehouses. In case of different floor levels, these differences should be compensated by slopes adapted to the type of means of transport used, but not more than 8%. The passageways between racks, containers, stacks of materials or walls intended only for handling them should be at least 0.75 m wide. If there is two-way traffic in these gangways, they shall be at least 1 m wide. It is always necessary to plan the distances between racks, containers or stacks of materials in such a way as to ensure free manoeuvring of loads with the means of transport provided by the warehouse [6].

- **Impact by moving parts.** Sources of danger: open windows, unprotected against wind blast, open doors to rooms, barrier in the parking lot in front of the building, open doors left in desks, cabinets. Effects: cuts, cut wounds, mild injuries (bruises, tumours, etc.). Preventive measures: use stopwatches for windows and doors when working during ventilation. It is strictly forbidden to approach barriers when lowering or lifting them. Report damaged door and drawer locks for repair [7].
- **Impact, crushing by falling objects.** Sources of danger: use of damaged, unstable racks, narrow passages between racks, failure to adjust the place of storage of materials to their weight, failure to secure or inadequate protection of objects during storage and transport, reloading of the transport trolley, inappropriate setting of the centre of gravity, loss of stability of the trolley. Potential consequences: fractures, crushing, injuries to the head, hands, legs. Methods of prevention: Using the fixed ladder when removing documents (materials) from higher shelves, special care should be taken. Small objects stored in boxes, containers. Heavier objects or larger ones placed on lower regiments. The technical equipment of the warehouse, including storage racks, should have a robust, stable structure. When storing goods on shelves, it is important to determine for each type of stored material: the place of storage, the method of storage and the permissible height. The weight of the stored materials must not exceed the maximum load of the racks and shelves, and the weight of the racks, including the load stored on them, must not exceed the maximum load of the floors and ceilings. The permissible loads on shelves, shelves, floors and ceilings should always be displayed in a visible place. The wheelchair operator should have completed a course - the truck driver in the category appropriate to the type of wheelchair [8].
- **Passing by.** Sources of danger: careless driving of a forklift truck, limitation of visibility of transported goods, driving outside designated roads, vehicles moving around the area around the company's premises (passenger cars), vehicles of customers, suppliers of the company. Possible consequences: bruises, head injuries, limbs, fractures, disability, death. Methods of prevention: moving only along designated routes. Sensitive areas where there is a risk of collision with obstacles, falls

or other hazards to workers must be clearly marked with diagonal stripes, black-yellow or red-white. Means of internal transport and equipment supporting storage works should meet their respective requirements and have: CE safety mark, UDT inspection, if required, and current certificates of technical inspection. Adherence to traffic signs and signals [9].

- **Perceptual overload of vision.** Possible sources of danger: insufficient natural light, low intensity lighting, local darkening of the storage area, blurring of light, lack of or poorly selected light sources, poorly selected luminaires, dirty luminaires, working with a screen monitor, incorrect positioning of the monitor, poor lighting - the resulting stroboscopic effect, damaged monitor (pixeling, flickering of the image), poorly located workstation in relation to side lighting (windows - natural light). Possible effects of the threat: computer vision syndrome (CVS) - a syndrome of eye and vision health problems associated with working in the vicinity, including: tearing and congestion of the eyes, redness of conjunctiva, impression of the presence of a foreign body (sand) under the eyelids, weight of the eyelids, burning or pinching sensation and eye pain, reduced visual acuity, double vision, short-term blurring of the image, color vision disorders, sleepiness, apathy, decreased concentration, stress. Eye diseases such as eyelid edge inflammation, acute conjunctivitis, dry eye syndrome, myopia. Examples of prevention: in warehouses with permanent workplaces, daylight should be provided unless this is impossible or inappropriate due to the materials stored or the type of warehouse. In such a situation, the employer must obtain the consent of the competent state voivodeship sanitary inspector issued in agreement with the district labour inspector to use only electric lighting. Regardless of the daylight in warehouses with fixed work places, electrical lighting should be provided in accordance with the Polish standard. Required minimum illumination [lx] of exemplary rooms, places in the warehouse:

- Corridors, traffic routes - 100lx
- Stairs - 150 lx
- Transport zones with traffic of means of transport - 150 lx
- Loading and unloading points - 150 lx
- Material storage locations - 100 lx

- Packaging and distribution zones - 300 lx
- Transitions without permanent service - 20 lx
- Passageways with service - 150 lx -
- Cloakrooms, washrooms, bathrooms and toilets - 200 lx.

Appropriate organization of the workstation with the screen monitor - side to windows, so that the screen position of the monitor in relation to light sources reduces glare and light reflections, if necessary, e. g. window blinds should be used to limit glare and light reflections. Ensuring proper technical condition of the monitor: characters on the screen should be clear and legible (font minimum 3 points, monitor at a distance of 50-70 cm from the eye), the image on the screen should be stable, without ripple or other forms of instability, the brightness and contrast of the sign on the screen should be easy to adjust depending on the lighting conditions of the workstation (black writing on a bright background is recommended), The monitor settings should be such that the screen can be tilted at least 20° backwards and 5° forwards and rotated around its axis by at least 120° - at least 60° in both directions, the center of the monitor should be approx. 20 cm below the eye line, the monitor screen should be covered with an anti-reflection layer. To reduce frequent movements of the head and frequent changes of the eye, the workstation with a screen monitor should be equipped with a document holder. Ideally, the document should be at the same height and distance from the eye as the monitor screen. Employee's use of a 5-minute break after each hour of work on a screen monitor. Performing relaxation exercises: looking out of the window away at the greenery, closing your eyes for 1 minute, 30-second sessions of frequent blinking, exercising your eyesight by watching three-dimensional images (stereograms) using computer applications (e. g. sending a message about the need to take a five-minute break). Occupational medicine tests (initial, periodic, kontrolmym) and, if the ophthalmologist has recommended, use the assigned corrective glasses. If you work more than 4 hours a day at the screen monitor, you are entitled to a refund of the purchase costs of corrective glasses. Proper room humidity to prevent the eyeball from drying out: min. 50%. If necessary, use humidifiers, ventilate rooms or use artificial tears. A diet rich in vitamins A and C, lutein [10].

- **Electromagnetic field.** Source of danger: working with an on-screen monitor, especially an old type. Potential effects: reduction of blood pressure and efficiency of the body, headaches, depression. Methods of prevention: use of TCO-certified monitors, maintenance of the required distance between adjacent monitors - min. 60 cm, maintaining the required distance between the employee and the back of the monitor - min. 80 cm, keeping the humidity in work rooms at a level of 50-60%, removing dust from the surface of the screen with a damp cloth before switching on the monitor. Turning on the computer several minutes before starting work (the most intense electrostatic field occurs for the first quarter of an hour after switching on the monitor). Presence of green plants (improving the state of air in terms of ionization). Use five-minute breaks after each hour of operation with a monitor [11].
- **Air movement - draughts.** Source of danger: open front door when receiving deliveries, simultaneous opening of windows and doors between rooms, driving a car with the glass lowered downwards. Consequences: colds, respiratory diseases, intensification of rheumatic diseases, cold and weakness of the body. Prophylactic measures: ensuring that work clothes are suitable for the prevailing weather conditions, in autumn and winter: putting on outer clothing while working outdoors and taking it off when entering the warehouse, closing the door to the warehouse immediately after loading is completed [12].
- **Fire, explosion.** Possible causes: improperly selected parameters of the electrical installation, short circuit in the installation, large quantities of documents, flammable materials placed next to hot objects or next to electrical devices, improper storage and use of flammable materials, smoking in prohibited places, careless handling of open fire. Possible consequences: thermal burns, disillusionment, internal and external body injuries as a result of escaping from the danger area, death. Methods of prevention: storage of chemicals in accordance with safety data sheets supplied by the manufacturer or supplier. Permanent control of fire protection status of the facility (carried out by the facility administrator). Supervision over the performance of the agreement with the administrator in the scope of timely performance of inspections and control of the technical condition of hand-held extinguishing agents and signalling

systems. Equipping work rooms with a number of handy fire-fighting equipment in accordance with fire regulations. Appropriate marking of escape routes, hand-held fire-fighting equipment and elements of fire protection system. Escape routes should be easy and quick to allow workers to get out into the open space and should never be obstructed. Doors to leave the warehouse should not be closed in such a way as to prevent workers from leaving the warehouse. Knowledge of how to act in case of fire. Ability to use hand-held fire-fighting equipment. Training of employees in emergency response and announced evacuation. Designation of smoking areas or establishment of a smoking ban on site. Designate evacuation coordinators and develop appropriate evacuation procedures. Maintaining order in rooms, not obstructing escape routes. Regular evacuation exercises [13].

- **Coating with hot liquid.** Causes: careless use of water during cooking, overflowing, spillage of water on a live appliance. Possible consequences: first and second degree thermal burns, electric shock. Preventive measures: carrying out activities related to meal preparation, tea brewing and their consumption exclusively in social rooms, using appliances commonly used in kitchens. Carefully pouring hot water into vessels [14].
- **Contact with sharp, rough parts.** Sources: hand tools for unpacking the delivered material to the warehouse (knives, chisels). Sharply finished storage items and goods. Effects: stabs, cuts, injuries. Methods of prevention: special care and order. Adequate management of the workplace. Small, sharp objects stored only in boxes, containers. Segregation of stored materials [15].
- **Air temperature - large temperature differences.** Source of danger: working in a cold store with a temperature of about 3 degrees Celsius, then going out into rooms with a much higher temperature. Prophylactic measures: use workwear suitable for the season or working room. Wearing insulated outer clothing when entering a refrigerated room [16].

LITERARY ACTIVITY

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