Safety guidelines for automatic system

Rossmann SDP

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I. Introduction

This document contains best practices and standard solutions which was developed in Rossmann SDP warehouse in Lodz as reference for Rossmann SDP warehouse in Pyskowice implementation.

II. General requirements for machines

Regulation of the Minister of Economy of 21st October 2008 on essential requirements for machines

§ 6.

1. Before placing the machine on the market or putting it into service, the manufacturer or its authorized representative shall:

1) ensure that the machine meets the relevant essential health and safety requirements of the Regulation;
2) ensure that the technical documentation referred to in Annex 2 to the Regulation is available;
3) provide the necessary information, especially a manual;
4) carry out the relevant conformity assessment procedures referred to in § 127;
5) draw up the EC declaration of conformity referred to in Item 1 of Annex 3 to the Regulation, and ensure that it is attached to the machine;
6) affix the CE marking, in accordance with the rules set forth in Annex 4 to the Regulation.

§ 10.

1. The machine should be designed and constructed in such a way that it is suitable for performing its function and can be operated, adjusted and maintained without posing hazards to those performing these activities under the conditions envisaged, taking into account foreseeable misuse.

2. In order to counteract the risks referred to in Paragraph 1, measures should be taken to eliminate all risks throughout the assumed life of the machine, including its transportation, assembly, disassembly, immobilisation and scrapping.

3. In selecting the most appropriate measures referred to in Paragraph 2, the manufacturer or its authorized representative should follow the following principles, in the order given:

1) eliminate or reduce risks as much as possible by designing and manufacturing machines that are intrinsically safe;
2) apply the necessary protective measures to risks that cannot be eliminated;
3) inform users of any residual risk caused by any shortcomings in the protective measures adopted, indicate whether training in this regard is necessary, and determine the need for personal protective equipment.

Marking

§ 54.

1. Any information or warnings shall be expressed in the official language or languages of the European Union of the Member State within the territory of which the machine is placed on the market or put into service,

and may additionally be accompanied by versions in another official language or languages of the European Union understandable to operators upon request.

2. It is recommended for the information and warnings to be written in the form of easily understandable symbols or pictograms.

§ 56.

1. Machine markings should be visible, legible and permanent. At a minimum, they should include:

1) the name and address of the manufacturer and its authorized representative, if any;
2) machine definition;
3) CE marking;
4) the designation of the series or type of machine;
5) serial number, if any;
6) the year of construction of the machine, understood as the year of completion of the production process.

Manual

§ 58.

1. A machine placed on the market or put into service must be equipped with a manual.

2. The manual should be written in at least one official language of the European Union. Such language version(s), verified by the manufacturer or its authorized representative, shall bear the inscription "Original Manual."

3. If the "Original Manual" does not exist in the official language or languages of the Member State in which the machine will be used, a translation into that language or languages should be provided by the manufacturer or its authorized representative or by the person introducing the machine into a given area. The translation should be labelled "Translation of the original manual".

4. The machine should be equipped with an "Original Manual" and, if applicable, a "Translation of the Original Manual."

5. In justified cases, the machine maintenance instructions intended for use by specialized personnel employed by the manufacturer or its authorized representative may be written only in the language spoken by that personnel.

6. The content of the manual, in addition to describing the intended use, should also take into account the foreseeable misuse.

7. For machines intended for general use, the manual should be formulated in a clear, transparent manner that allows all users to use it easily.

Content of the manual

§ 59

1. At a minimum, the manual should include the following information, if applicable:

1) the name and full address of the manufacturer and its authorized representative;
2) the machine's designation, which was included on the machine itself, except for the serial number;
3) EC declaration of conformity or a document showing the content of the EC declaration of conformity, indicating the details of the machine, not necessarily including the serial number and signature;
4) general description of the machine;
5) drawings, diagrams, descriptions and explanations required for using, maintaining and repairing the machine, as well as checking the correctness of its functioning;
6) a description of the workstation or workstations that operators may hold;
7) a description of the machine's intended use;
8) warnings about unauthorized uses of machinery, which experience shows may occur;
9) assembly, installation and connection instructions, including drawings, diagrams and methods of attachment, and specifying the chassis or setup on which the machine should be mounted;
10) regarding installation and assembly to reduce noise or vibration;
11) regarding the commissioning and operation of the machine and, if necessary, instructions for operator training;
12) information regarding the risk existing in spite of application of intrinsically safe structure, security measures and additional protective measures;
13) regarding protective measures that the user has to apply in appropriate cases, together with provision of personal protective equipment;
14) the basic parameters of the tools that can be used in the machine;
15) conditions in which the machine meets the stability requirements during operation, transport, assembly, dismantling, inactivity, tests or foreseeable failures;
16) specifying safe conditions for transportation, handling and storage, with indication of the weight of the machine and its individual parts, if there is a need for separate transportation;
17) how to proceed in the event of an accident or malfunction; if a locking function is used on the machine - an instruction how to perform safe unlocking of the device should be provided;
18) description of adjustment and maintenance activities that should be carried out by the user, and the preventive maintenance measures;
19) instructions for the safe performance of adjustment, maintenance, assembly and disassembly of machine components, including protective measures to be taken during these operations;
20) specifications of spare parts to be used, if they affect the health and safety of operators;
21) noise emission parameters:
    a) A-weighted sound pressure level at workstations, if it exceeds 70 dB(A); however, if the level does not exceed 70 dB(A), this should be clearly stated in the manual,
    b) peak instantaneous C-weighted sound pressure value at workstations, if it exceeds 63 Pa (130 dB in relation to 20 μPa),
    c) A-weighted sound power level of the machine, if the A-weighted emitted sound pressure level at workstations exceeds 80 dB(A);
22) concerning the radiation emitted by the machine, especially non-ionizing radiation, which may have adverse effects on the operator and exposed persons, especially when they have implanted active or inactive medical devices.

Machine control

Regulation of the Minister of Economy of 21st October 2008 on essential requirements for machines

§ 18.

1. Control systems should be designed and constructed so that:

a. they provide security and prevent hazardous situations;
b. defects in the control system's hardware and software do not lead to hazardous situations;
c. they are able to withstand the stresses of their intended use and the influence of external factors;
d. errors in logic circuits do not lead to hazardous situations;
e. foreseeable human errors during operation do not lead to hazardous situations.

2. Special attention should be paid so that:

a. the machine cannot start unexpectedly;
b. the parameters of the machine cannot change uncontrollably, if such a change could lead to hazardous situations;
c. the machine stops after a stop command is issued;
d. no moving part of the machine or item attached to the machine can fall off or be ejected;
e. automatic or manual stopping of moving parts cannot be disturbed;
f. protective devices provide effective protection or send a stop command;
g. safety-related components of the control system operate consistently throughout the entire assembly of machines or unfinished machines.

3. A wirelessly controlled machine should automatically stop when it receives an invalid control signal or when communication is lost.

§ 19.

1. The control devices should be:

a. clearly visible and identifiable, with the use of pictograms where appropriate;
b. arranged in a way that ensures safe operation, immediate and unambiguous;
c. designed so that their direction of movement is consistent with the effect being produced;
d. located outside hazardous areas, with the exception of emergency stop devices or an overhead control panel, where necessary;
e. placed in such a way that their operation does not cause additional risks;
f. designed in such a way that the desired effect cannot take place without intended action if there is any risk associated with it;
g. made to withstand foreseeable loads;
h. made in such a way that their arrangement, displacement and the resistance associated with operating them coincide with the action caused, taking into account the principles of ergonomics.

2. If the control device has been designed and manufactured to perform different functions and there is no mutual unambiguous relationship between them, the function to be performed should be signalled and, if necessary, confirmed.

§ 20.

1. The machine should be equipped with the indicators necessary for safe operation.

2. The operator should be able to read indicator readings from the control station.

3. From each control station, the operator should be able to make sure that there are no people in the hazardous areas, or the control system should be designed and constructed in such a way as to prevent startup if any person is in the hazardous area.

§ 21.

1. If it is not possible to meet the requirements referred to in § 20 (3), the control system should be designed and implemented in such a way that the start-up of the machine is preceded each time by an acoustic or visual warning signal.

2. In the case referred to in Paragraph 1, exposed persons should be given time to leave the hazard zone or prevent the machine from starting.

3. If necessary, measures should be taken to ensure that the machine can only be controlled from control stations located in one or more predetermined zones or locations.

4. If there are several control stations, the control system should be designed so that control from one station precludes the use of the others, except for the use of stop controls and emergency stop devices.

5. Where a machine has two or more operator stations, each station should be equipped with all required controls so that operators do not interfere with each other or create dangerous situations for each other.

§ 22.

1. It should be possible to start the machine only by intentionally activating the control device provided for this purpose.

2. The provision of Paragraph 1 shall also apply in the case of:

1) restarting the machine after it has been stopped, regardless of the reason for the stoppage,

2) introduction of significant changes to the operating conditions of the machine

- except when restarting the machine or making significant changes to its operating conditions does not result in hazardous situations.

3. Where a machine is equipped with several actuating controls, so that operators may cause mutual hazards, additional devices should be installed to eliminate such risks. If safety requires that starting or stopping occur in a specific sequence, devices are needed to ensure that these actions are performed in the correct order.

4. In the case of a machine operating in automatic mode, it may be possible to start the machine and restart it after stopping or change the operating parameters without operator intervention, provided that this does not lead to a hazardous situation.

§ 23.

1. The machine should be equipped with a control device to stop the machine completely and safely.

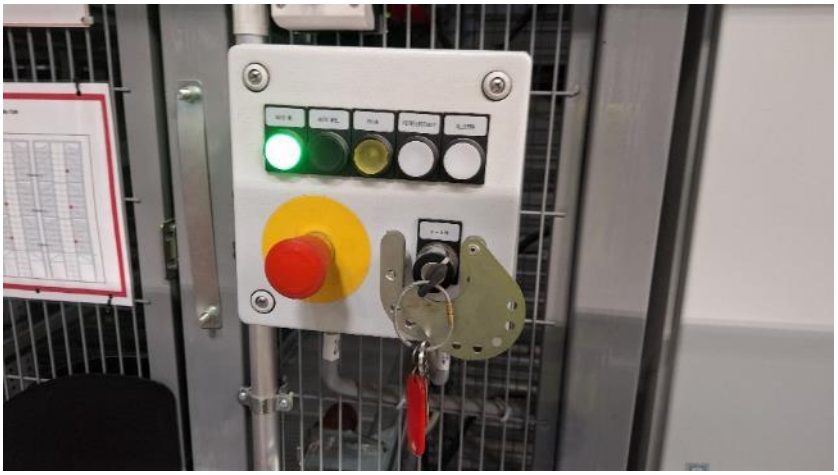
2. Each workstation should be equipped with a control device for stopping, depending on the existing hazards, some or all functions of the machine so that the machine remains safe. Stop control should take precedence over start control.

3. When the machine or its hazardous functions are stopped, the power supply to the relevant actuators should be disconnected.

4. Where a stop control element is required for operational reasons that does not disconnect the power supply to the respective actuators, the stop condition must be monitored and maintained.









- Markings, signs and textual information must be easy to understand and unambiguously specify what part of the machine or operation they refer to. If graphic symbols are used, they should be in accordance with standardized symbols. Safety signs should be in accordance with PN ISO 7010 Graphic symbols - Safety colours and safety signs - Registered safety signs. Textual information must be in Polish, understandable to the user and exposed persons. The marking used should be permanent and legible. Recommended font height is 5mm.
- All information that may be displayed on control panels, screens or monitors must be in Polish.
- In the controls responsible for starting machinery, a solution must be used that allows locking the installation by more than one person, preventing it from restarting until everyone has left the danger zone.
- Use the following standards to design the control system:

  - PN-EN 61310-3:2010 Safety of machinery - Indication, marking and control - Part 3: Requirements for the location and operation of control elements
  - PN-EN 61310-2:2010 Safety of machinery- Indication, marking and control - Part 2: Requirements regarding marking
  - PN-EN 61310-1:2009 Safety of machinery - Indication, marking and control - Part 1: Requirements for visual, acoustic and tactile signals
  - PN-EN 60204-1:2018 Safety of machinery - Electrical equipment of machinery - Part 1: General requirements

Emergency stop

Regulation of the Minister of Labour and Social Policy on general occupational health and safety regulations

§ 52. Controls

1. Each machine should be equipped with a control element designed to stop it completely and safely.
2. When necessary due to the hazards posed by the machine and its nominal stopping time, the machine should be equipped with an emergency stopping device.
3. Machine controls that affect safety must be visible and identifiable and marked in accordance with the requirements of the Polish Standards.
4. Control elements must not create any hazards, especially those caused by their unintentional use.

Regulation of the Minister of Economy of 21st October 2008 on essential requirements for machines

§ 24.

1. The machine should be equipped with at least one emergency stop device to eliminate or prevent the occurrence of the hazard.

2. The provision of Paragraph 1 shall not apply to:

   1) machines where an emergency stop device would not reduce the risk due to the impossibility of reducing the stopping time or the impossibility of taking specific measures necessary to counteract the risk;

   2) portable, hand-held and hand-guided machines.

3. The device referred to in Paragraph 1 should:

1) have clearly recognizable, visible and quickly accessible controls;

2) stop the dangerous process as soon as possible, without creating additional risks;

3) initiate or enable the initiation of certain security movements when necessary.

4. As soon as the active operation of the emergency stop device ceases after the generation of the stop signal, the signal should be sustained by locking this device until it is intentionally unlocked.

5. It should not be possible to lock the emergency stop device without generating a stop command. Unlocking the emergency stop device can only be done by performing appropriate actions, and it should not restart the machine, but only allow it to start.

6 .The emergency stop function must be available and ready for use at all times, regardless of the machine's mode of operation.

PN-EN ISO 13850:2016 **Machine safety -- Emergency stop function**

- Emergency stop devices should be designed to be easily identified and activated by the operator or others who may need to use them. Controls - buttons should be easily activated by hand.
- The emergency switch should be accessible and visible.
- The emergency switch should be equipped with a device that helps prevent unintentional activation of the emergency switch.



- The emergency stop function should bring the device to a stop in the shortest possible time.
- The minimum height of the emergency stop device above the floor should be 0.6 m, and the maximum height should be 1.7 m.



- In any case, the activation of the emergency stop device should not be impaired. To prevent unintentional activation of the emergency stop device, certain precautions can be taken, such as:
    - Locating the emergency stop device away from areas with predictably heavy traffic,
    - Selecting the type of emergency stop device,
    - Selecting the right size or shape of the emergency stop device,
    - Mounting the emergency stop device in the recess of the control panel.
- **It is recommended to avoid the use of a protective cover around the emergency stop device, except when it is necessary to prevent unintentional activation and other measures are not possible.**

PN-EN 619:2022 Continuous handling equipment and systems. **Safety requirements for equipment for mechanical transport of individual loads**

- Emergency stop devices must be placed at all control stations and work areas, including manual loading and unloading points. The distance between the emergency switch and any place in the workplace must not exceed 5 m. For workplaces on straight assembly lines, the distance must not exceed 10 m.
- In addition, emergency stop devices along the transportation system must be as follows:
    - one or more emergency actuators, which must be installed so that at least one of them is accessible within 10 m of any point on the equipment; This distance may be doubled in confined spaces for straight (with no change of direction) belt, roller, chain and overhead conveyors with a transport length greater than 80 m, if the conveyor system is stopped at least at this length and/or
    - one or more cable-controlled switches located along the installation; or
    - conveyor power disconnect device if the distance from any accessible point of the conveyor to the disconnect device is 10 m or less.

III. Cargo weights

- The weight of cargo - i.e. bins, AKL containers - must not exceed the permissible standards in force in Poland. Lifting standards for men should be adopted for design.

Regulation of the Minister of Labour and Social Policy on occupational health and safety during manual transport works and other works involving physical exertion

Chapter 3. Manual handling of objects by one worker

§ 13. Limit on the weight of objects lifted and carried by one worker

1. The weight of objects lifted and carried by one worker must not exceed:

    1) for women - 12 kg for permanent work and 20 kg for casual work;

    2) for men - 30 kg for permanent work and 50 kg for casual work.

2. The weight of objects lifted by one worker to a height above the shoulder girdle may not exceed:

    1) for women - 8 kg for permanent work and 14 kg for casual work;

    2) for men - 21 kg for permanent work and 35 kg for casual work.

IV. Work premises, transport routes, access paths, passages

Width of transport routes

Regulation of the Minister of Labour and Social Policy on general occupational health and safety regulations

§ 4. Passageways and transportation routes

1. The employer shall be obliged to provide passageways and transportation routes, hereinafter referred to as “roads", pedestrian routes, hereinafter referred to as "passages", and fire accesses on the premises of the workplace, which are made and marked, in accordance with Polish Standards (PN) and relevant regulations, and to maintain them in a condition that does not create hazards for users. Roads and passageways and fire access routes must not lead through areas where there are hazards to their users.
2. Roads and passages should be sized appropriately for the number of potential users and the types and sizes of transport equipment used and loads moved. The minimum dimensions of roads and crossings are defined by the Polish Standards.

§ 5 Inclined planes

1. There should be no thresholds or steps on transport routes and in warehouses. In the case of different floor levels, these differences should be compensated for by ramps with inclination adapted to the type of transport used, but not more than 8%.
2. The ramps should allow safe movement of workers and convenient transport of loads.

PN-M-78010:1968 Internal transportation - Roads and doorways - design guidelines.

Purpose of the road		Minimum road width in cm on straight sections	
		For non-motorised means of transportation	For motor vehicles
1-way traffic	Only for pedestrian traffic with load	b = a + 30	-
	Only for means of transport	b = a + 60	b = a + 60
	For means of transport and pedestrian traffic	b = a + 90	b = a + 100
2-way traffic	Only for pedestrian traffic with load	b = 2a + 60	-
	Only for means of transport	b = 2a + 90	b = 2a + 90
	For means of transport and pedestrian traffic	b = 2a + 180	b = 2a + 200
Explanations: a - the width of a man with a load or the width of a means of transport, b - the width of the transport route in cm (but not less than 120 cm).			

Width and height of escape routes

Regulation of the Minister of Infrastructure of 12th April 2002 on the issue of technical conditions that should be met by the buildings and their location

§ 242.

1. The width of horizontal escape routes should be calculated in proportion to the number of people who can be on a given floor of the building at the same time, assuming at least 0.6 m per 100 people, but not less than 1.4 m.

2. It is allowed to reduce the width of the horizontal escape route to 1.2 m if it is intended for the evacuation of no more than 20 people.

3. The height of the escape route should be at least 2.2 m, while the height of the local depression should be 2 m, with the length of the lowered section not exceeding 1.5 m on each section of the escape route with a length of 10 m.

4. The leaves of the doors constituting the exit to the escape route must not, when fully opened, reduce the required width of the route. The requirement does not apply to doors equipped with devices that automatically close them.

Requirements for marking obstacles, dangerous places and roads

Regulation of the Minister of Labour and Social Policy on general occupational health and safety regulations

Appendix #1

§ 13.

1. Roads in buildings should be clearly delineated with continuous stripes of clearly visible colour (taking into account the ground colour) - preferably yellow or white.

2. The layout of road delineation lanes should take into account the necessary (safe) distance between vehicles and any obstacle that may be nearby, and between pedestrians and vehicles.



Surface area of work rooms

Regulation of the Minister of Labour and Social Policy on general occupational health and safety regulations

§ 19.

1. The area and height of the work premises should ensure that the requirements of occupational safety and health are met, taking into account the type of work performed, the technologies used, and the duration of employees' stay in these premises.

2. There should be at least 13 m3 of free room volume and at least 2m2 of free floor space (not occupied by technical devices, equipment, etc.) for each of the workers simultaneously employed in the permanent work premises.

Access to workstations

Regulation of the Minister of Labour and Social Policy on general occupational health and safety regulations

§ 47.

1. There should be safe and convenient access to each workstation, with a clear height of not less than 2 m along its entire length.
2. In cases justified by the design of machinery and other technical equipment, it is permissible to reduce the height of the access to 1.8 m while simultaneously protecting and marking it appropriately with safety signs in accordance with the Polish Standard.
3. Passages between machines and other equipment or walls intended only for the operation of such equipment should be at least 0.75 m wide; if there is two-way traffic in these passages, their width should be at least 1 m.



Access and passages to technical equipment

Regulation of the Minister of Infrastructure of 12th April 2002 on the issue of technical conditions that should be met by the buildings and their location

- **§ 99. 1.** Access and passage to cranes and other technical equipment may be in the form corridors, platforms, landings, galleries, stairs, subject to § 68 (1), ladders or brackets, made of non-combustible materials.
    - The general requirements for access and passages to cranes should also be applied if working access routes are made to rooms and parts of the building not intended for human habitation,

related to the periodic operation of machinery and equipment, as well as the inspection and maintenance of the technical condition of the building.

- **§ 100** Access and passageways should have a clear height of at least 1.9 m and may be located above the workstation at a height of at least 2.5 m from the floor level of the workstation.

Regulation of the Minister of Economy of 21st October 2008 on essential requirements for machines

§ 50.

. Adjustment and maintenance points should be located outside hazardous areas. Ensure that adjustments, maintenance, repair, cleaning and other service operations can be performed during machine idle time.

4. Wear and tear parts of an automatic machine should be possible to replace easily and safely.
5. Access to the components of the machine should be facilitated and allow tasks to be performed with the necessary technical means, in accordance with the procedure specified by the manufacturer.
6. **The design of the machine should allow safe access to all areas necessary for operation, adjustment and maintenance.**

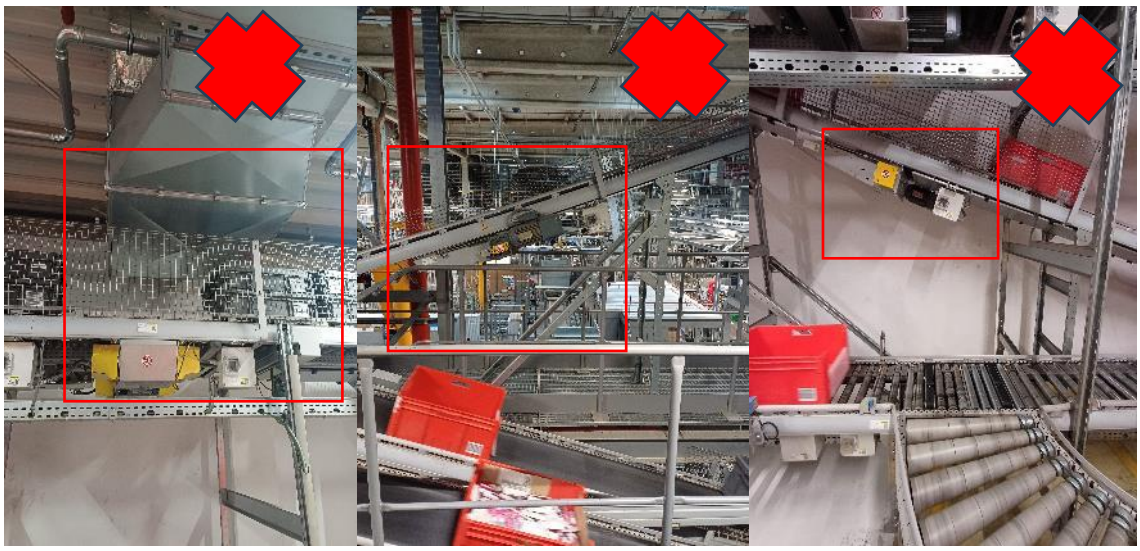
- Provide safe and convenient means of access to all intervention zones and areas of the machine in accordance with applicable standards:
    - **PN EN ISO 14122-1:2016 - Safety of machinery. Permanent means of access to machinery - Part I: Selection of permanent means of access and general access requirements.**
    - **PN-EN ISO 14122-2:2016 Safety of machinery - Permanent means of access to machinery - Part 2: Work platforms and walkways**
    - **PN-EN ISO 14122-3:2016 Safety of machinery - Permanent means of access to machinery - Part 3: Stairs, ladder stairs and balustrades**

- In view of the design of the machine, the environment or the occasional use of the passage, the clear width may be reduced from 0.8 m to 0.6 m.
- If the passage serves as an escape route, it is recommended for it to meet the condition specified in local fire regulations.

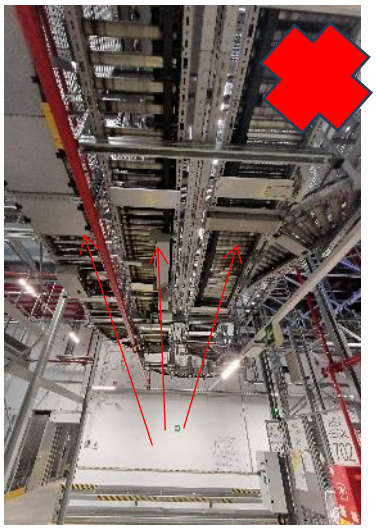




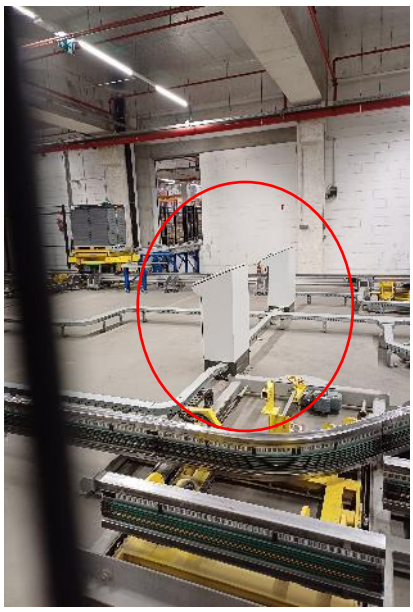
- Sufficient space must be provided in the service area for service work to be performed near the components of the automatic system.



- Difficult access to equipment components - ensure safe and easy access and adequate space to perform work in areas where failures may happen.



- Use of three conveyors side by side - it is necessary to separate the conveyors to allow easy access during service work



- Control panels should be placed outside hazardous areas.

Ladders

Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations.

§ 108

Work on elevated spots not intended for human occupancy

When working on: ladders, brackets, scaffolds and other elevated spots not intended for human occupancy, at a height of up to 2 m above floor or ground level that do not require the worker to lean beyond the contour of the device on which they are standing or to assume any other forced body position that poses a risk of falling, it must be ensured that ladders, brackets, scaffolds, platforms and other devices are stable and protected against unpredictable changes in position, and have adequate strength for the expected load.

Regulation of the Minister of Infrastructure of 12th April 2002 on the issue of technical conditions that should be met by the buildings and their location

§ 101

1. In exceptional cases, justified by utility considerations, ladders or brackets, permanently attached to the structure, may serve as access route and passage between different levels.

2. The width of the ladders or brackets referred to in Paragraph 1 should be at least 0.5 m, and the spacing between rungs must not be greater than 0.3 m. Starting from a height of 3 m above the floor

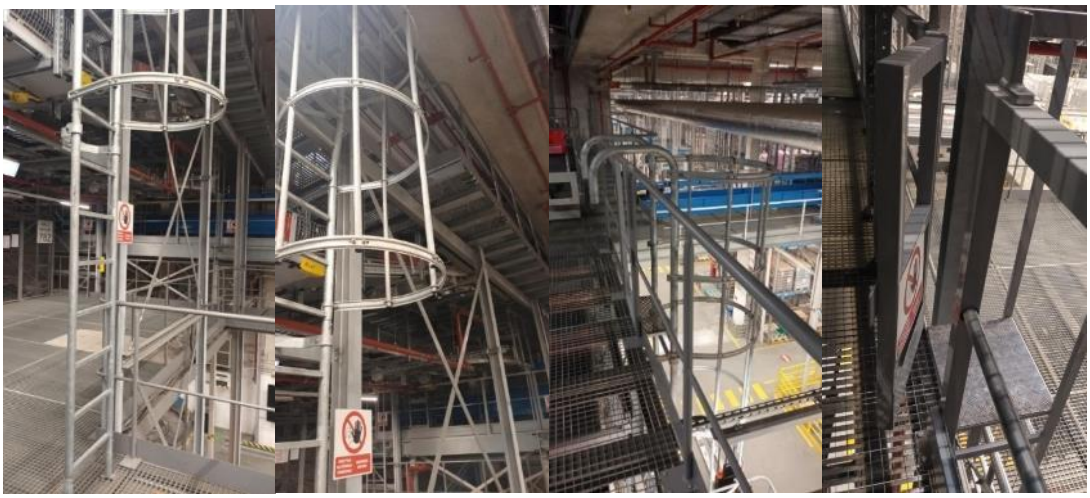
level, ladders or brackets should be equipped with fall protection devices such as safety hoops, spaced not more than 0.8 m apart, with vertical bars spaced not more than 0.3 m apart.

3. The distance of the ladder or bracket from the wall or other structure to which they are attached must not be less than 0.15 m, and the distance of the safety hoop from the ladder, at the point furthest from it, must not be less than 0.7 m and more than 0.8 m.

4. Landings with railings should be placed every 8-10 m of ladder or bracket string height. The upper ends of the longitudinal members (sides) of ladders should be brought out at least 0.75 m above the level of the entrance (platform), if no other fall protection is used.

PN-EN ISO 14122-3 Machinery. Security Fixed means of access to machines. Part 3 Stairs, ladder stairs and railings

- The gate leading to the platform should open inward and should be equipped with a self-closing device.
- The gate should prevent the user from pushing against it and falling through the opening



Stairs and handrails

Regulation of the Minister of Infrastructure of 12th April 2002 on the issue of technical conditions that should be met by the buildings and their location

In order to provide access to rooms/corridors located on different levels, stairs should be used, and, depending on the purpose of the building, also ramps.

§ 68.

a) The limiting dimensions of fixed stairs in mixed-use buildings are specified in the table:

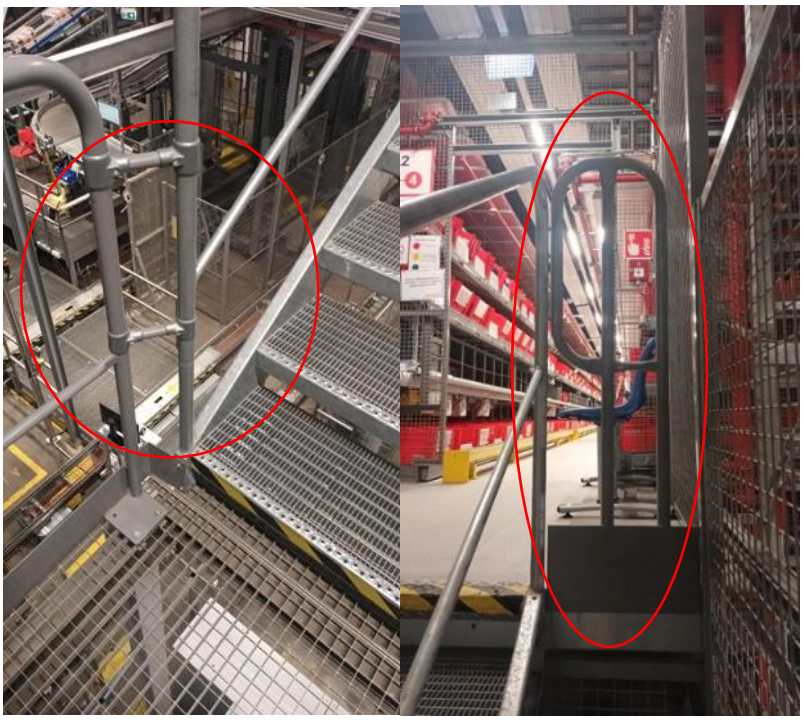
Przeznaczenie budynków	Minimalna szerokość użytkowa (m)		Maksymalna wysokość stopni (m)
	biegu	spocznika	
1	2	3	4
Budynki mieszkalne jednorodzinne i w zabudowie zagrodowej oraz mieszkania dwupoziomowe	0,8	0,8	0,19
Budynki mieszkalne wielorodzinne, budynki zamieszkania zbiorowego*) oraz budynki użyteczności publicznej*), z wyłączeniem budynków *zakładów opieki zdrowotnej*[5)], a także budynki produkcyjne*), magazynowo-składowe oraz usługowe, w których zatrudnia się ponad 10 osób	1,2	1,5	0,175
Przedszkola i żłobki	1,2	1,3	0,15
Budynki opieki zdrowotnej*)	1,4	1,5	0,15
Garaże wbudowane i wolno stojące (wielostanowiskowe) oraz budynki usługowe, w których zatrudnia się do 10 osób	0,9	0,9	0,19
We wszystkich budynkach niezależnie od ich przeznaczenia schody do kondygnacji podziemnej, pomieszczeń technicznych i poddaszy nieużytkowych	0,8	0,8	0,2

§ 69

2. The number of steps in one flight of fixed stairs should be no more than 17 steps.

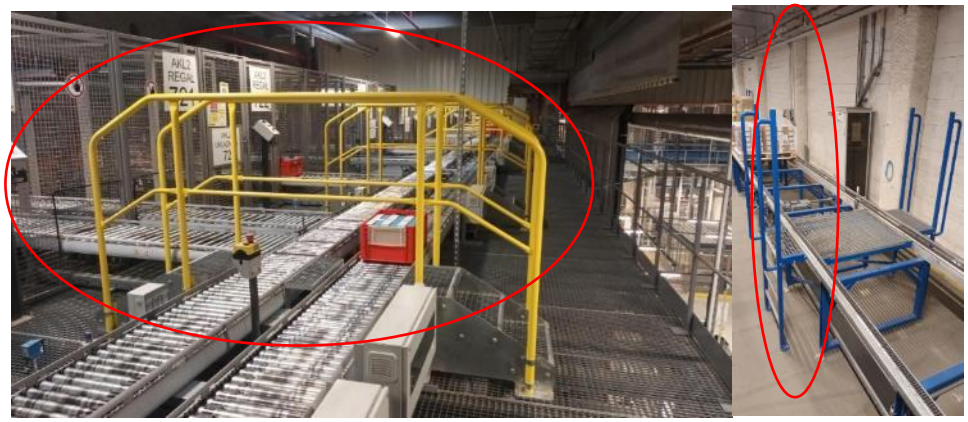
4. The width of the stair steps should be derived from the condition specified by the formula: 2h + s = 0.6 to 0.65 m, where 'h' is the height of the step, and 's' - its width.

- Stairs, railings and stair railings should meet the requirements described in **PN-EN ISO 14122-3 Machinery** standard**. Security Fixed means of access to machines. Part 3 Stairs, ladder stairs and railings**



- Railings should be interconnected. In the case of two separate ones, a fill should be provided.





- Service stairs with handrails should be provided for each setup

Access platforms and railings

Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations.

§ 106. Guardrails

1. On surfaces raised more than 1.0 m above floor or ground level, where workers may be present in connection with their work, or serving as passages, there should be railings consisting of guardrails placed at a height of at least 1.1 m and curbs at a height of at least 0.15 m. Between the guardrail and the curb there should be a crossbar halfway up or the space should be filled in such a way that people cannot fall out.

2. If, due to the nature and conditions of work at height, the use of railings referred to in paragraph 1 is impossible, other effective means of protecting workers from falls from height, appropriate to the nature and conditions of the work shall be used.

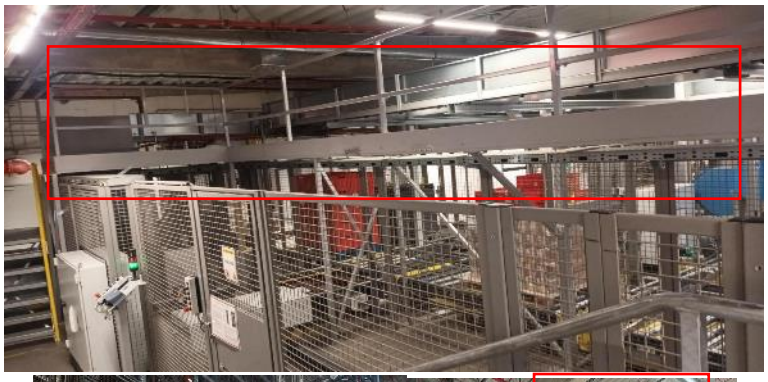
§ 108 Work on elevations not intended for human habitation

When working on: ladders, brackets, scaffolds and other elevated spots not intended for human occupancy, at a height of up to 2 m above floor or ground level that do not require the worker to lean beyond the contour of the device on which they are standing or to assume any other forced body position that poses a risk of falling, it must be ensured that the work platform meets the following requirements:

a) the platform area should be sufficient for workers, tools and necessary materials,
b) the floor should be horizontal and level, permanently fixed to the structural elements of the platform,
c) legible information on the size of the permissible load should be placed in a visible place on the platform.

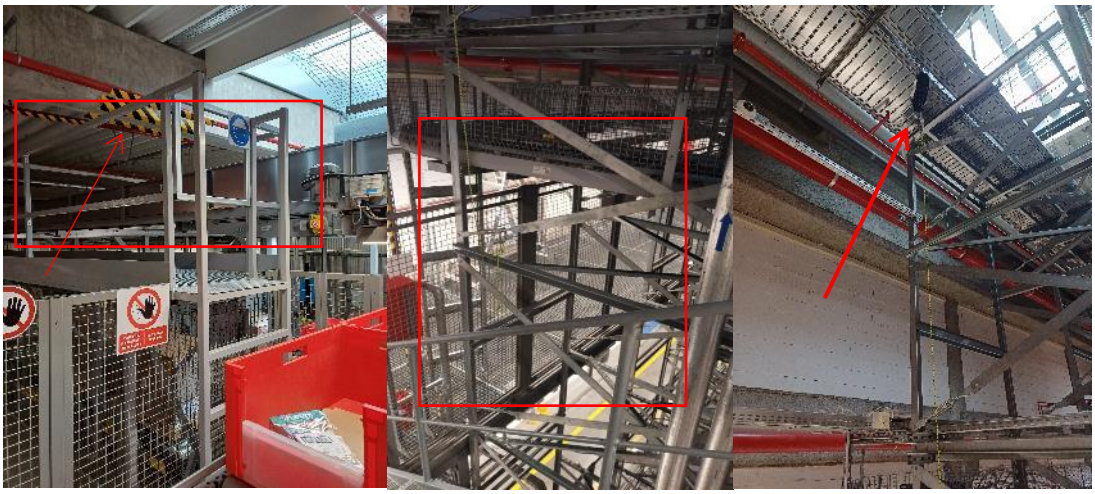
The platforms should meet the requirements described in Item **4 of PN-EN ISO 14122-2:2016 Safety of machinery**. **Permanent means of access to machinery. Part 2: Work platforms and walkways**

- Where possible, work platforms should be designed and located to allow people to work in an ergonomic position at a height of 500 mm to 1,700 mm above the surface of the work platform without increasing the risk of falling from height.





- Access platforms should be provided for maintenance personnel to ensure easy access and the ability to safely perform maintenance activities.

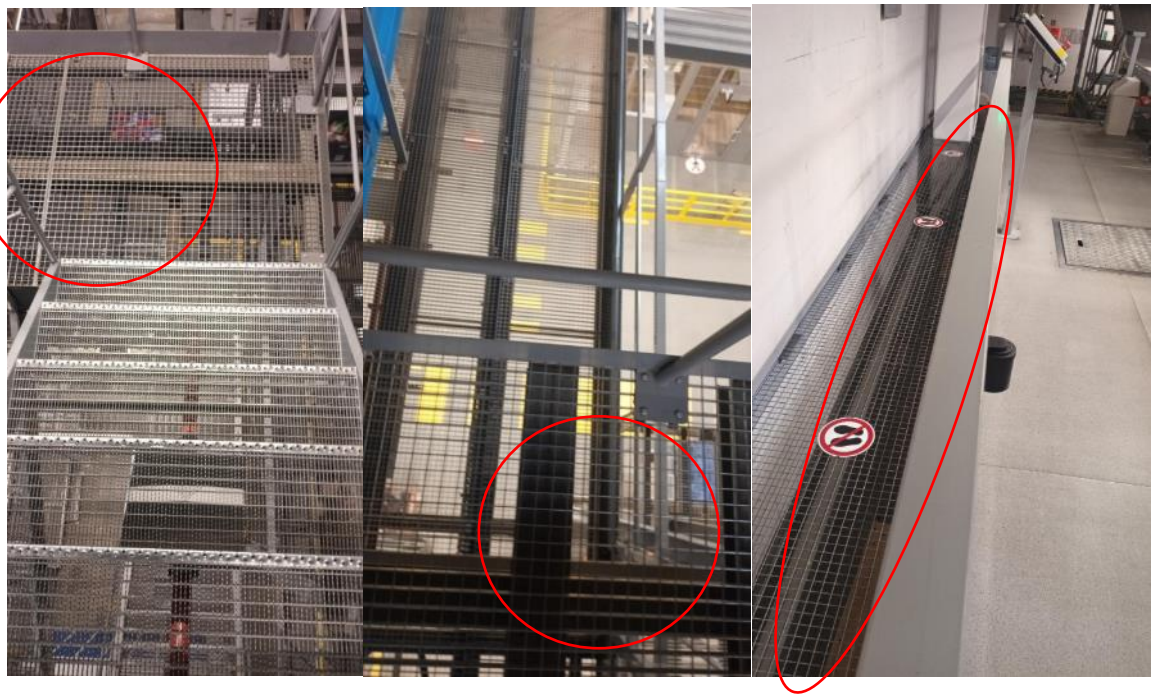


- Where a fixed means of access is not possible, folding, extendable, adjustable-height or hinge-mounted parts can be used
- Adjustable platforms and passageways shall meet the requirements described in Item **4.2.6 of PN-EN ISO 14122-2:2016 Safety of machinery. Permanent means of access to machinery. Part 2: Work platforms and walkways**

Floors

PN-EN ISO 14122-2:2016 Safety of machinery. Permanent means of access to machinery. Part 2: Work platforms and walkways

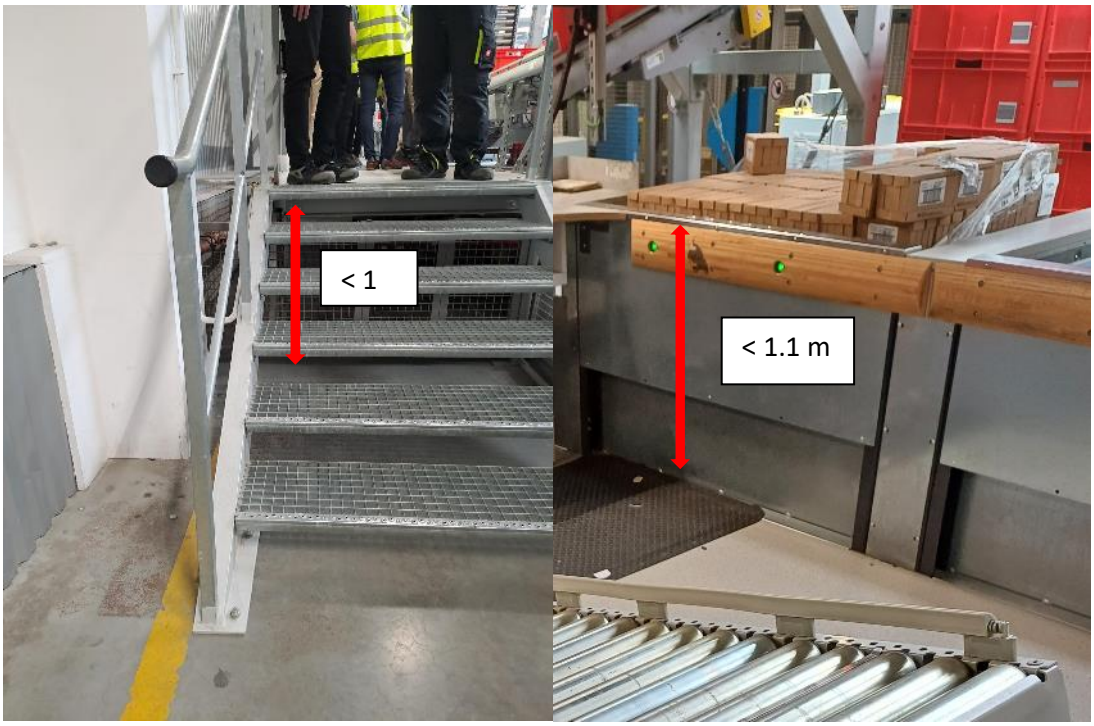
- The largest holes in the floors of working platforms or passageways should be such that a 35 mm diameter sphere cannot pass through them.
- The floors above where people work should have such openings that a 20mm diameter sphere cannot pass through them, unless the same level of protection is provided by other suitable means. Where a risk assessment indicates that the hazards caused by objects or other materials falling or passing through openings in the floor are more serious than those caused by slipping or falling, the floor should be solid.



V. Works at height

Location of workstations

- Example of Repackaging Plant 2 Distribution Centre in Łódź, Poland. If the workstations are designed on platforms located at a height of more than 1 m it will be necessary to enclose the workstation with railings with a height of 1.1 m. In view of the ergonomics of the workstation and the safety of workers during the removal of goods from pallets (the possibility of falling), we want to avoid the classification of these activities as work at height, and the platform located at a height of not more than 1 m is recommended.

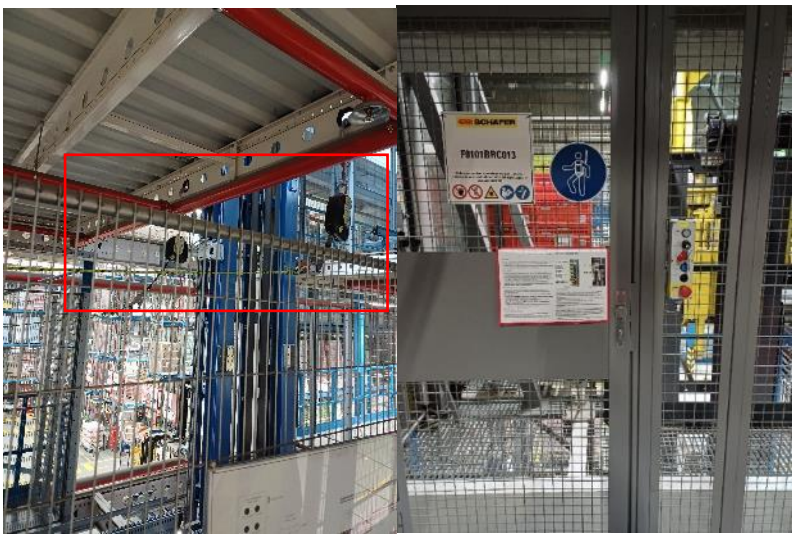


Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations.

§ 106. Guardrails

On surfaces raised more than 1.0 m above floor or ground level, where workers may be present in connection with their work, or serving as passages, there should be railings consisting of guardrails placed at a height of at least 1.1 m and curbs at a height of at least 0.15 m. Between the guardrail and the curb there should be a crossbar halfway up or the space should be filled in such a way that people cannot fall out.

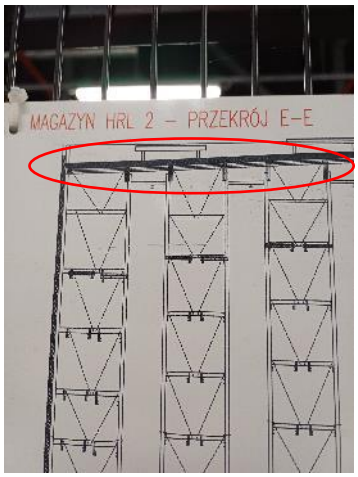
Protective measures against falls from height



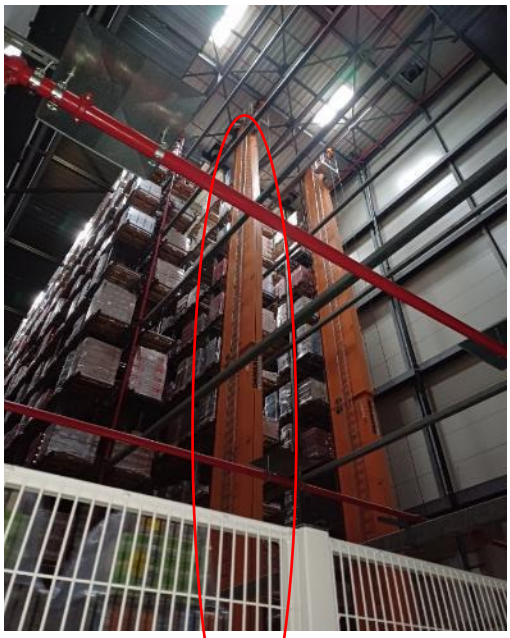
- Service/cleaning work at elevators - the need to install fall protection systems and proper marking with pictograms based on PN-EN ISO 7010:2020-7 Graphic symbols -- Safety colours and safety signs - Registered safety signs.



- It is recommended to install roller shutters to prevent the intrusion of unauthorized persons into the zone of operation of the elevator in accordance with PN-EN 619:2022 Continuous transport equipment and systems. Safety requirements for equipment for mechanical transport of individual loads



- Provision of anchor points for fall protection systems at each level of the occurrence of service points, including the last level of storage.



PN-EN 528+A1:2022 Rail dependent storage and retrieval equipment -- Safety requirements for S/P equipment All machines with an overall height of more than 5 m must be equipped with a ladder in accordance with EN ISO 14122-4:2016 standard to allow full mast height access.

- The access ladder must be designed to allow access at any height.
- In deviation from EN ISO 14122-4:2016, the first step of such a ladder may have a maximum height of 500 mm above the nominal ground level.
- In deviation from EN ISO 14122-4:2016, platforms are not mandatory for machines with an overall height of more than 30 m if:
    - A camera system is mounted on the lift truck that allows the operator to monitor potential emergencies without climbing the mast, and the operator is equipped with:

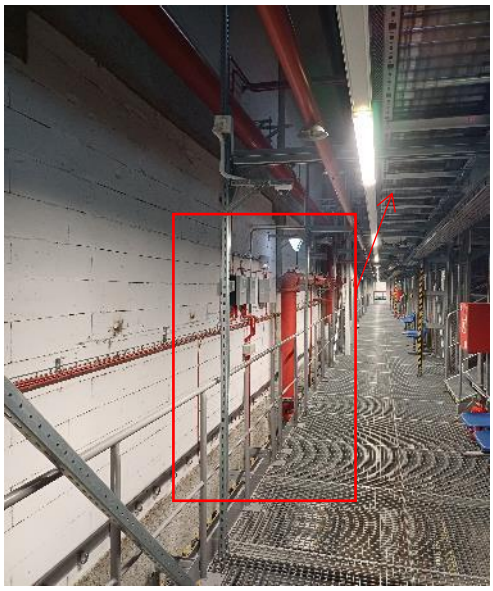
        - full safety harness in accordance with PN EN 361:2002 Personal protective equipment against falls from a height. Safety harnesses and
        - positioning belt for work in accordance with PN EN 358:2018 Individual protective equipment for positioning during work and preventing falls from heights. Belts that fix the working position and limit movement, and cables that fix the working position so that the operator can rest in any position along the ladder without using their hands or
    - a climbing assistance system is provided, in accordance with 4.9.7.2 or
    - an access cabin with electric drive is provided, in accordance with section 4.9.7.3

Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations.

§ 110

When working on: poles, masts, tower structures, stacks, building structures without ceilings, as well as when setting up or dismantling scaffolding, and when working on ladders and brackets at a height of more than 2 m above the level of the outdoor area or floor, it is particularly necessary to:

1. before starting work, check the technical condition of the structures or equipment on which work is to be performed, including their stability, resistance to the anticipated load and protection against unpredictable changes in position, as well as the technical condition of the fixed elements of the structure or equipment to be used for attaching safety lines;
2. ensure that workers use fall protection equipment - appropriate to the type of work performed - such as: safety harnesses with a safety line attached to fixed elements of the structure, safety harnesses with a lap belt (for working with support - on poles, masts, etc.);



- In areas where it is necessary to perform service work on a ladder set up on a platform, which may result in a worker falling to a level lower than the platform, vertical nets should be installed to prevent a worker from falling from height.

Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations.

§ 106.2. If, due to the nature and conditions of work at height, the use of railings is not possible, other effective means of protecting workers from falls from height, appropriate to the type and conditions of the work, shall be used.

PN-EN 528+A1:2022 Rail dependent storage and retrieval equipment -- Safety requirements for S/P equipment

- For minor maintenance work, if the floor is more than 1 m above ground level, use fall protection equipment in the form of a safety braces with a harness.
- If the safeguards resulting from PN EN ISO 14122:2016 1-4 cannot be used for technical reasons, anchorage points for fall protection PPE must be provided in accordance with EN 795:2012. Alternatively, structural parts can be identified as anchor points if they meet the requirements under EN 795:2012.

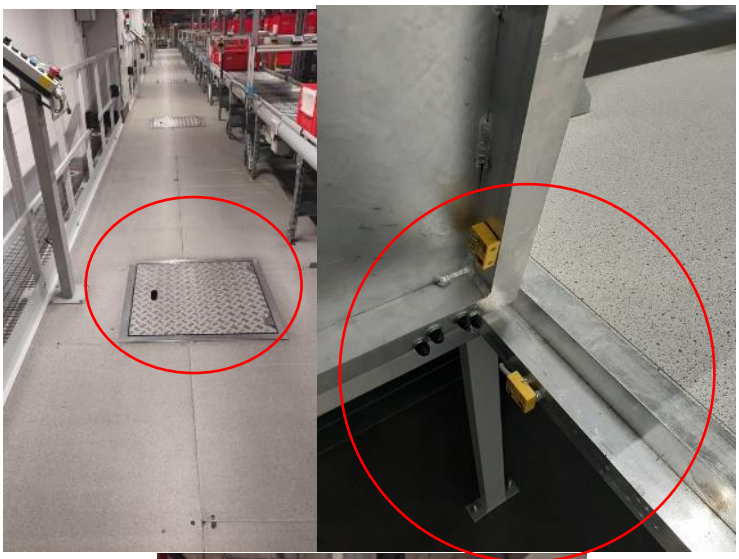
VI. Fencing and access to hazardous areas / technical areas / manholes

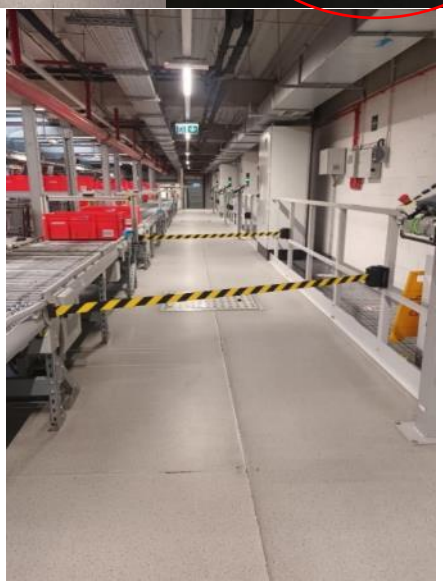
Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations. (Dz. U. 2003 No. 169, Item 1650)**,**

§ 6. Marking of places with hazards for workers

1. Places in the work establishment where there are hazards to workers should be marked with visible colours or safety signs in accordance with the requirements specified in Annex 1 to the Regulation and in the Polish Standards.
2. If the signage is not sufficient to ensure the safety and health of the worker, hazardous areas should be excluded from use through appropriate fencing or other means.
3. Openings and cavities should be closed with appropriate covers, and if this is not possible - properly fenced and marked.

- Persons must be protected from injury caused by moving machinery at any level by restricting access to machine work areas or by fitting machines with sensors. Permanent guards must be provided in accordance with applicable standards:
  - PN-EN ISO 13857:2020 Safety of machinery. Safety distances preventing lower and upper limbs from reaching danger zones.
  - PN-EN ISO 14120:2016-03 Safety of machinery -- Guards -- General requirements for the design and construction of fixed and movable guards



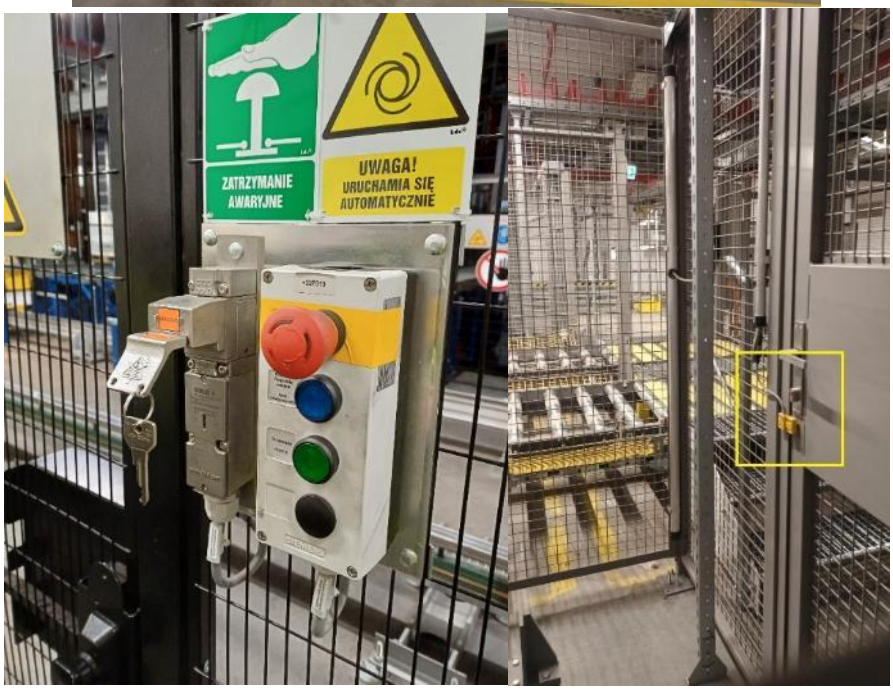


- It is recommended that manholes be closed in such a way as to prevent unrestricted access by unauthorized persons and feature a device to ensure that the setup is stopped when the manhole is opened.



- In doors without the use of an access key, self-closing mechanisms should be installed.





- Access to the hazardous area is possible only through an access door. Doors should be opened with coded keys/interleaved keys accessible only to Maintenance Technicians. The protection system should comply with PN-EN 14119:2014-03 Safety of machinery -- Interlocking devices coupled to guards -- Principles of design and selection

- **In accordance with PN-EN 619:2022 Continuous handling equipment and systems -- Safety requirements for equipment for mechanical handling of individual loads**
    1. Entrance doors from any work area or traffic area to a restricted area must be equipped with self-closing means and designed so that they can be locked and opened from the restricted area without the use of keys or tools to avoid entrapment of personnel.

2. A free-standing area of at least 1.0 m × 1.0 m should be provided at the entrance to the danger zone and at each service station to allow personnel to close the door and have a clear view of the continuous transport system. Passages must be placed between all these locations, which must be identifiable and feature a lighting system with intensity of at least 100 lux.

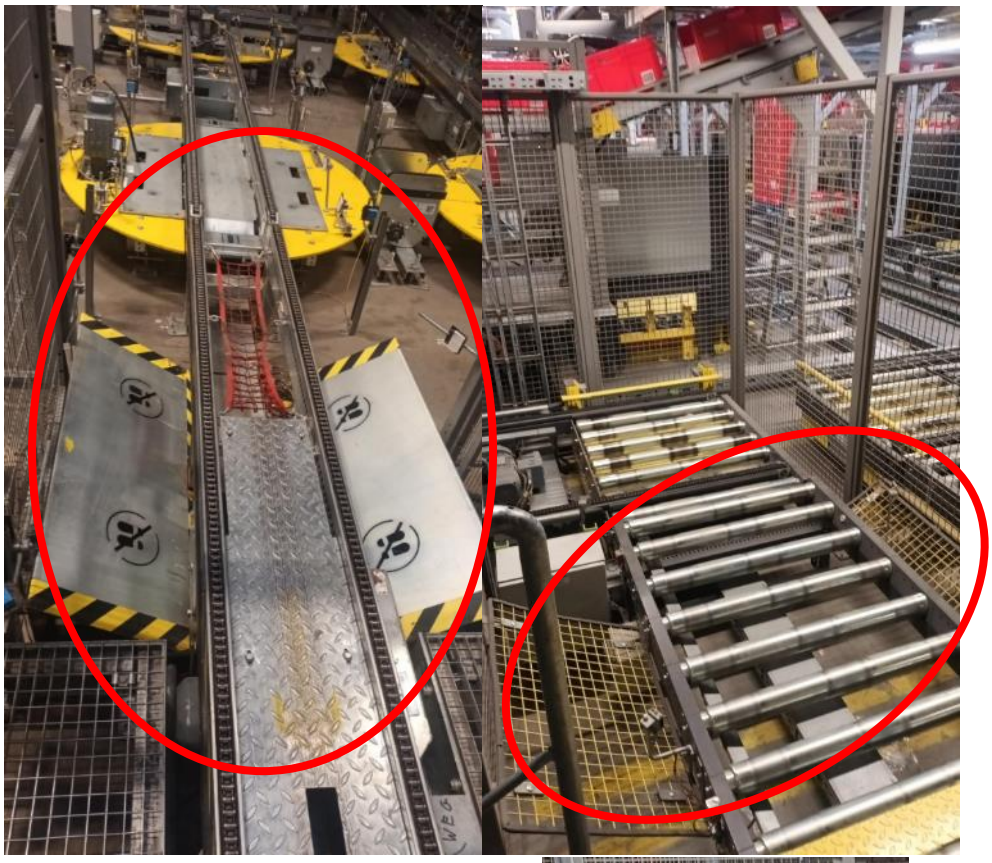
- **In accordance with PN-EN 528+A1:2022 Rail dependent storage and retrieval equipment -- Safety requirements for S/P equipment**

1. Doors and/or removable panels in the perimeter room must meet the following requirements:
    - doors and/or removable panels should be provided in the perimeter room to allow access, operation, repair or maintenance;
    - the doors in the room used for the entry and exit of persons should open only to the outside and should be designed in such a way that they can only be opened from the outside with a key, but can be opened from the inside without a key. The door key must be the same key or permanently connected to the switch key.
    - with the door open in the enclosure area, it is necessary to prevent the machine from moving in the corresponding machine work area. Restarting can only be done on board the machine or from the control station outside the enclosure with the door closed. Unexpected startup must be prevented in accordance with PN EN 60204-32:2008;
    - access doors leading directly to the machine control station should be locked so that they open only when the machine is in the proper position for access;
    - removable covers that are frequently opened or can be opened without tools should be built and secured in the same way as doors.

2. Unauthorized access to the restricted area shall be prevented by:
    - Locked doors - with key available only to a designated person - the door should close automatically on each side and should be monitored, connected to an alarm, so that if the alarm is triggered the person in charge (some supervisor) will be notified in case the door is open for more than 5 minutes.
    - use the following marking at each entrance that indicates that access is allowed only to authorised persons.



Preventing access through the conveyor





- Preventing access between conveyors or between a conveyor and a fixed guard

Protection against human entry into the danger zone through the conveyor should be carried out in accordance with the recommendations of the following standards:

- **PN-EN 619:2022 Continuous transportation equipment and systems. Safety requirements for equipment for mechanical transport of individual loads - Item 4.2.8, Item 4.2.9 and Annex D**

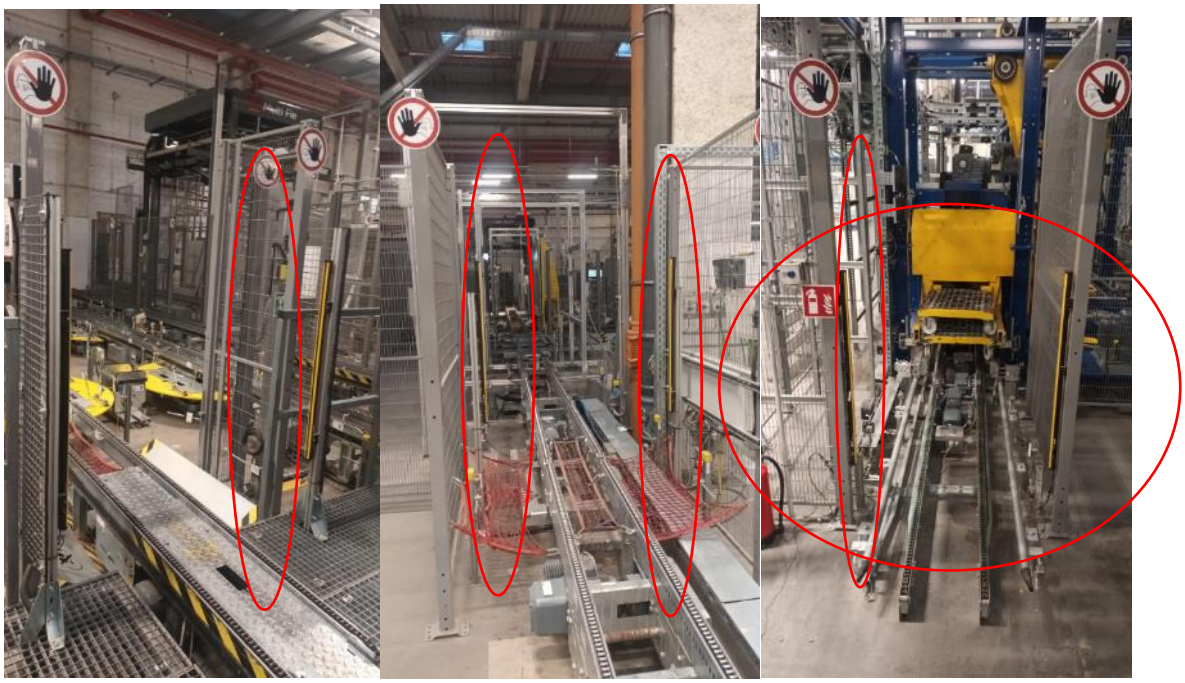
- **PN-EN 528+A1:2022 Rail dependent storage and retrieval equipment - Annex C**

Stopping the dangerous movement of machinery

- In unprotected areas with dangerous machine traffic, one of the solutions should be used:
  - light curtains,
  - pressure-sensitive mats or plates mounted between the chains of a two-chain conveyor.



- When using elevators to transport pallets, it is necessary to protect the elevator area from unauthorized entry in the form of light barriers, in addition, bumpers should be used to stop the descent of the elevator in case of encountering an obstacle, such as a worker's foot.
-



- Light curtains should be used as described in EN ISO 13855:2010 Safety of machinery -- Location of technical protective measures in view of approach speeds of human body parts

- It is recommended to install light curtains in any place where there is a risk of the conveyor entering the danger zone.
- Mounting height of the light curtain:
    - for the lowest located radius should be less than or equal to 300 mm,
    - for the highest located radius should be greater than or equal to 900 mm.

Risk of falling objects

Regulation of the Minister of Economy on essential requirements for machines of 21st October 2008.

§ 30 The manufacturer should take precautions to prevent hazards caused by falling or ejected objects.

§ 36 Shields and protective devices should:

- allow - as far as possible without removing guards or disabling protective devices - the access necessary to carry out work related to the attachment or replacement of tools and maintenance, with such access limited only to the area necessary to carry out such work,

- protect - as far as possible - from the ejected or falling materials or objects and from emissions caused by machinery;

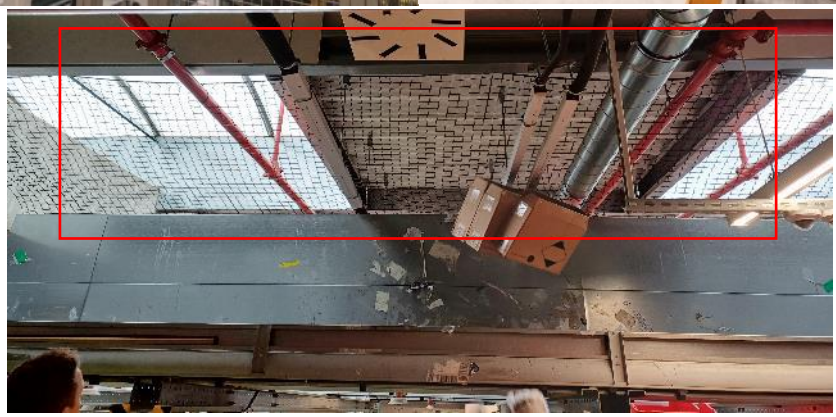
In accordance with **PN-EN 619:2022 Continuous handling equipment and systems - Safety requirements for equipment for mechanical handling of unit loads**

- Conveyors must be designed to prevent injury to persons from falling conveyed loads, such as through side guards and/or shielding such as rope nets, wire mats, plates or barriers. These measures must be designed to stop the downward movement of the rated load and support it.





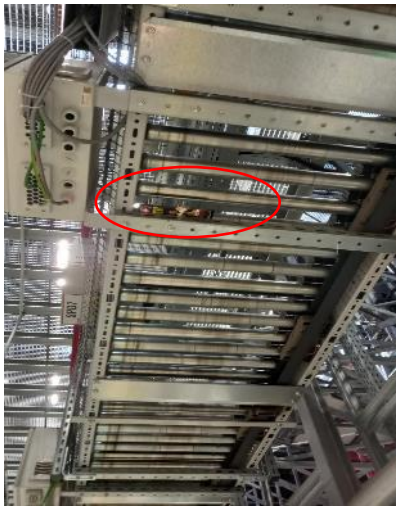




- Solutions must be applied to prevent hazards caused by falling or ejected objects.



- Provide a structural element that limits the possibility of a bin falling out of the picking area.



- Ensure that conveyors located above passageways are protected from objects falling from height.



- It is recommended to install fall protection for transported goods in elevators.

Passing through conveyors

- If the evacuation is carried out through areas with roller/chain conveyors, additional emergency power should be provided to the conveyors to remove any loads that may stop on the conveyor when the power is cut, which could lead to the evacuation being prevented.
- In work areas and traffic areas, it is necessary to ensure that people passing through conveyors are not exposed to hazards associated with the loads being moved. Depending on the case, at least one safety measure listed in EN 619:2022 should be provided. Regardless of the case, it must be ensured that the machine can only be restarted by deliberate operation on the control element provided for this purpose.
- Passages (stairs, ladders, railings) should be in accordance with PN-EN ISO 14122:2016 (1-3)



In accordance with PN-EN 619:2022 Continuous handling equipment and systems - Safety requirements for equipment for mechanical handling of unit loads

The hazards and risks at the crossings are assessed taking into account the speed and frequency of cargo transported, as well as the frequency of use by people and the location of the crossing.

A conveyor cross-passage is considered safe if the time between the ability to see the moving goods and their arrival at the passage is at least 4 s and:

- cross passages on roller conveyors have a minimum width of filler plate "a" with an anti-slip coating (e.g., corrugated sheet metal, expanded metal mesh, gratings) of 0.1 m with a total width "b" of the roller conveyor cross section of at least 0.5 m (see Figure C.39), or

- cross passages on chain conveyors and double belt conveyors have an anti-slip coating (e.g., corrugated sheets, expanded metal, grilles) between chains with a minimum width "a" of 0.5 m plus 0.3 m on each side of the cross passage (see Figure C.23), or

- Belt, plate or roller conveyors up to 0.8 m wide are equipped with rests with a minimum depth "b" of 0.3 m on both sides (see Figure C.24).

If the time between the sighting of the moving transported goods and their arrival at the aisle is less than 4 s or the width of belt or plate conveyors exceeds 0.8 m, one of the following measures shall be used to stop the conveyors:

- protective devices, such as optoelectronic or pressure-sensitive devices;
- movable interlocked guards.

VII. General requirements.

Sharp edges

Regulation of the Minister of Economy on essential requirements for machines of 21st October 2008

§ 30. Item 2 Accessible parts of the installation should not have sharp edges, sharp corners or rough surfaces that could cause injury. Such situations should be eliminated.



- Sharp edges, sharp angles and rough surfaces should be avoided, as described in EN ISO 12100:2010 Item 6.2.2.1(c).

Guards of hazardous components

Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations

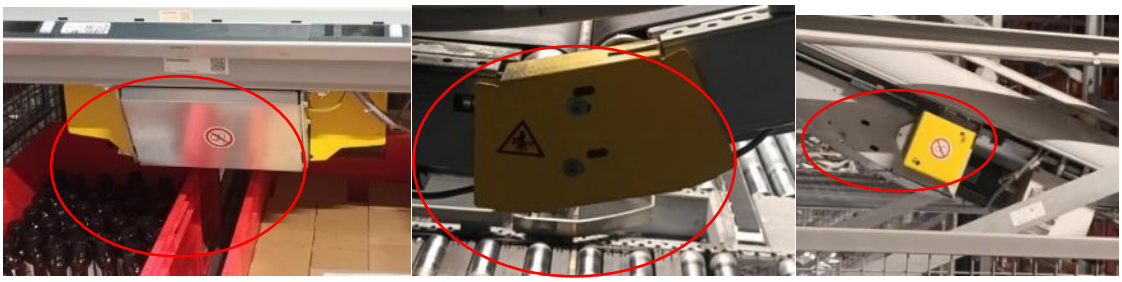
§ 55 Protective equipment of machines

1. Moving parts and other parts of machines that pose a hazard if they come into contact with them should be, up to a height of at least 2.5 m from the floor (platform) level of the workstation, shielded or provided with other effective protective devices, except where compliance with these requirements is not possible due to the function of the machine.
2. Belts, chains, belts, gears and other components of drive systems and parts of machinery that pose a risk of falling, located above workstations or passageways at a height of more than 2.5 m from floor level, should be shielded at least from below with permanent guards.
3. Guards used on machinery should prevent direct access to the hazardous area. Incomplete guards (made of mesh, perforated metal, bars, etc.) should be located at such a distance from hazardous elements that, given the size and shape of the openings, it is not possible to directly touch these elements. Safety distances are defined by the Polish Standards.
4. Machines should be marked with safety signs and colours, in accordance with the requirements set forth in Annex 1 to the Regulation and in the Polish Standards.

Regulation of the Minister of Economy on essential requirements for machines of 21st October 2008

§ 33 Moving parts of the machine shall be designed and constructed to prevent the risk of contact that may cause an accident, and where the risk still exists, moving parts of the machine shall be equipped with guards or protective devices.

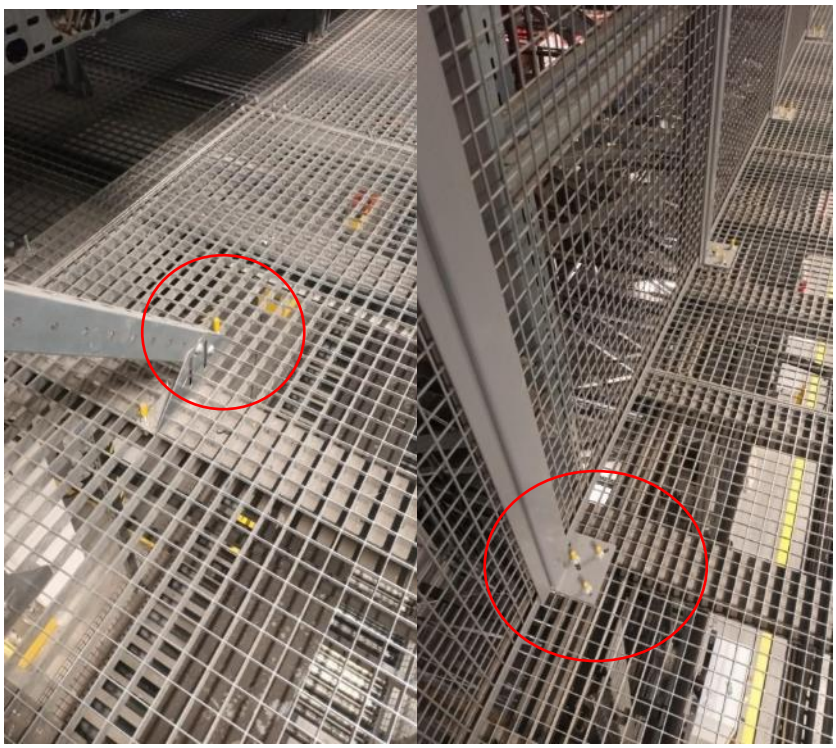




- Moving parts of the drive should be equipped with guards to protect against hazards in accordance with the guidelines of **PN-EN ISO 14120:2016 Safety of machinery -- Guards -- General requirements for the design and construction of fixed and movable guards**, and marked in accordance with **PN-EN ISO 7010:2020 Graphic symbols -- Safety colours and safety marks -- Registered safety marks**

Structural connections

- Connection points must be secured against loosening or alteration during normal operation. Connection points to the floor or steel structure should be made as a bolted or welded connection.
- Protruding elements need to be marked with a safety colour.



Transport work with auxiliary equipment

REGULATION OF THE MINISTER OF LABOUR AND SOCIAL POLICY1) of 14th March 2002 on occupational health and safety during manual transport works and other works involving physical exertion

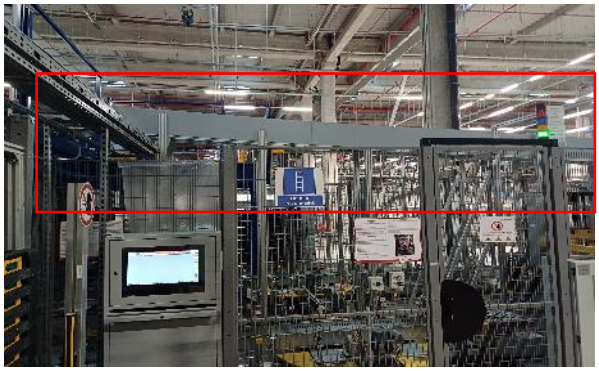
§ 3.

1. The employer is obliged to use appropriate technical and organizational solutions aimed at eliminating manual transportation work.
2. If it is not possible to eliminate manual transport work, the employer - in order to reduce the nuisance and hazards associated with the performance of these activities - is obliged to organize work accordingly and equip employees with the necessary auxiliary equipment and personal protective equipment .





- In the service areas of parts of the installation, the necessary space must be provided to carry out the mentioned work, taking into account the need for auxiliary equipment such as cranes, overhead cranes, winches, service tables, as well as taking into account maintaining the appropriate road widths.



- The use of a system for evacuating bins from heights.

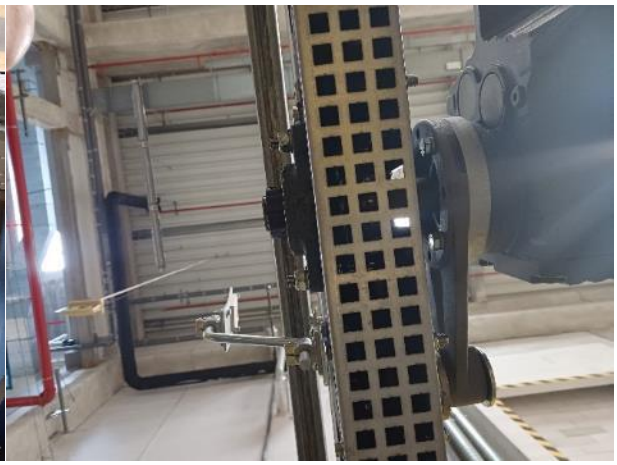
Fire hazard

REGULATION OF THE MINISTER OF INFRASTRUCTURE of 12th April 2002 on the issue of technical conditions that should be met by the buildings and their location

§ 207 Fire protection of the building

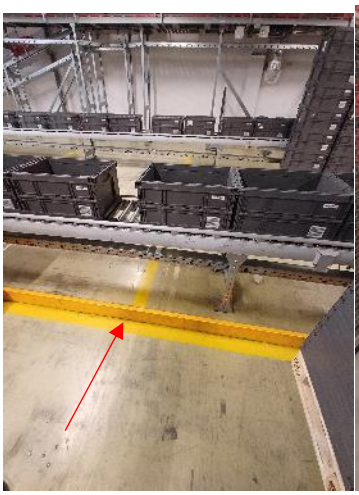
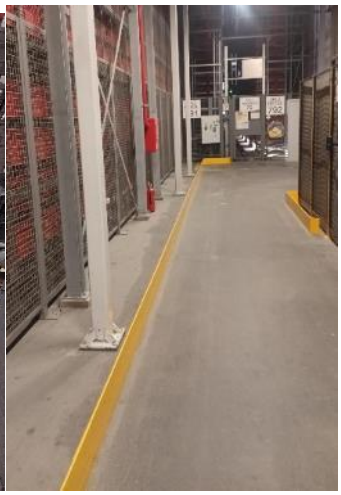
- The building and related facilities should be designed and constructed in such a manner as to reduce the possibility of fire.





- Solutions should be used to eliminate the possibility of fire (places for generating dust from brushes, pallet debris, for example)

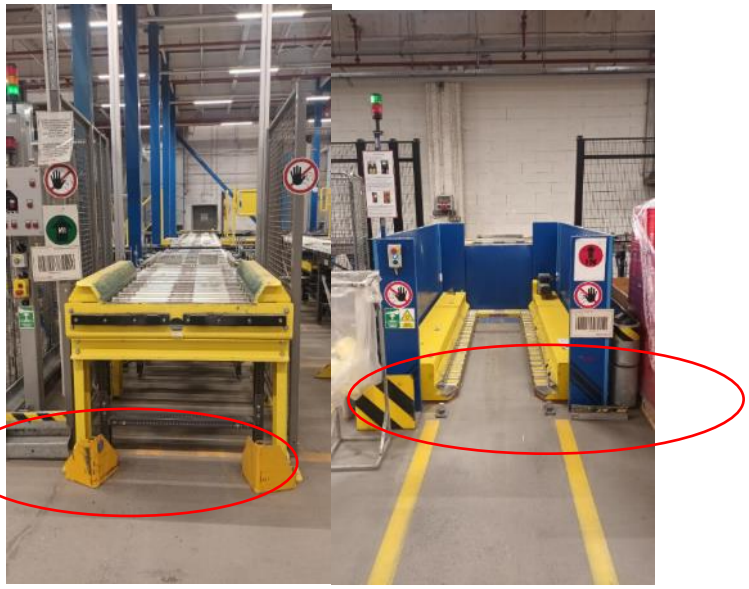
Protection of systems/structural components/workstations from mechanical damage in the forklift zone

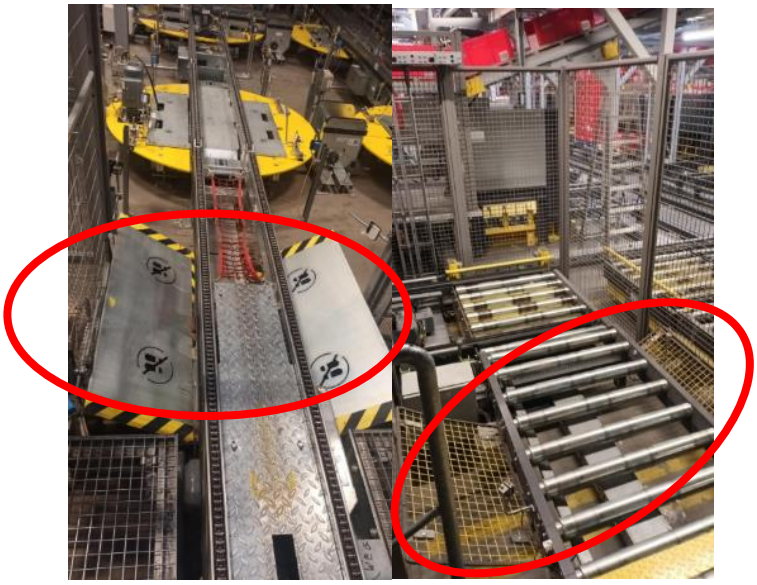



- The use of curbs/bumpers with the appropriate width of transport and communication routes




- Ramps/points of insertion on and removal of pallets from the system should be protected from unintentional damage.





Cable connections



- Each cable connection must be inserted into the cabinet with the highest standards of quality and due diligence. Any cable or compressed trough on the floor should be protected by mechanical covers, especially where access to services is required or expected. Access to the covered parts of the system should be possible by opening the service access.

Ventilation / air conditioning



- Ventilation/air-conditioning outlets should be placed in such places on the workstation as not to expose workers to direct air blowing

Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations.

§ 35. Air conditioning or ventilation

1. The air supplied to the work premises from outside when using air conditioning or mechanical ventilation should be cleaned of dust and substances harmful to health.

2. Air conditioning or ventilation must not cause drafts, cooling or overheating of the work premises. This does not apply to emergency ventilation.

3. The air flow coming from the supply ventilation equipment should not be directed directly at any workstation.

Electrical systems and equipment

Regulation of the Minister of Economy of 21st October 2008 on essential requirements for machines

§ 38. 1. An electrically powered machine should be designed, constructed and equipped to eliminate hazards of an electrical nature.
Regulation on general occupational health and safety regulations

§ 10 Electrical installations and equipment should be made and operated in such a way that they do not expose workers to electric shock, atmospheric overvoltage, harmful effects of electromagnetic fields, and do not pose a risk of fire, explosion or other harmful effects.





Electrical cabinet



Every electrical cabinet must be:

- marked with pictograms in accordance with PN standards;
- equipped with a marked main switch;
- equipped with safety switches;
- protected from unauthorized access, in accordance with PN-EN 60204-1:2018 Safety of machinery - Electrical equipment of machinery - Part 1: General requirements.

VIII. Work processes

Repackaging station

Regulation of the Minister of Economy on essential requirements for machines of 21st October 2008

§ 16.

) The machine should be designed and constructed so as to minimize the discomfort, fatigue, and physical and mental strain felt by the operator under the intended conditions of use. To this end, it is necessary to apply the principles of ergonomics

- The workstation should have the following characteristics:
  - the ability to freely perform motor activities in a comfortable position (especially applies to work and control activities),
  - the work object and controls being placed within optimal limb reach,
  - adjustment of certain spatial parameters of the workstation to the user's changing body dimensions (individual adjustment),

- good visibility (e.g., of the work process itself and signalling devices),
- elimination of risks (e.g., possibility of accidents).

The organization of workstations should take into account the guidelines of the following standards:

PN-EN 614-1 Safety of machinery - Ergonomic principles of design - Part 1: Terminology and general principles

Ergonomics of the workstation

Regulation of the Minister of Economy on essential requirements for machines of 21st October 2008

§ 16.

1. The machine should be designed and constructed so as to minimize the discomfort, fatigue, and physical and mental strain felt by the operator under the intended conditions of use. To this end, ergonomic principles should be applied, including:

1) taking into account the variety of physical conditions of operators, their strength and capacity;

2) providing sufficient space for the movement of the operator's body parts;

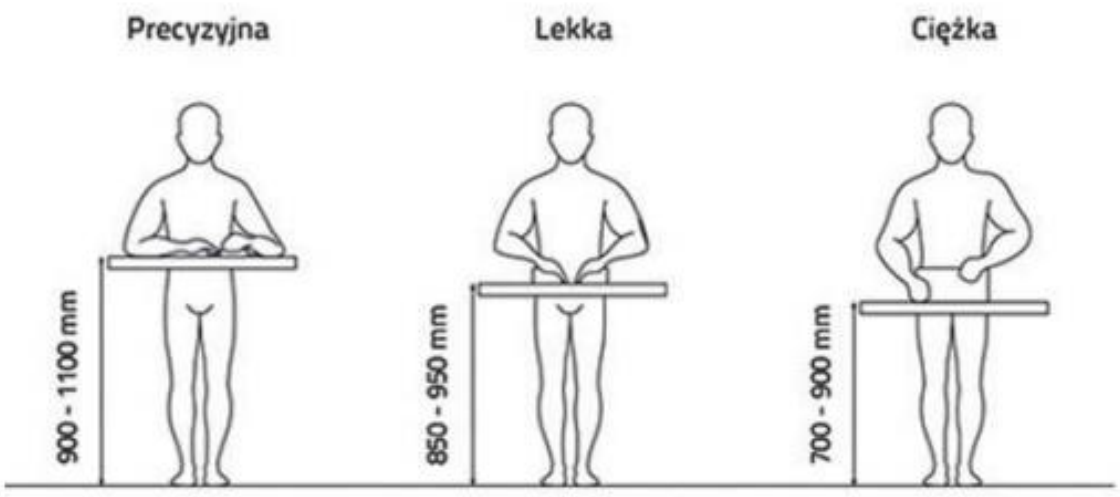
3) avoiding forcing the pace of work by the machine;

4) avoiding observation that requires prolonged focus;

5) adjusting the interaction of the operator and the machine to the foreseeable characteristics of the operators.



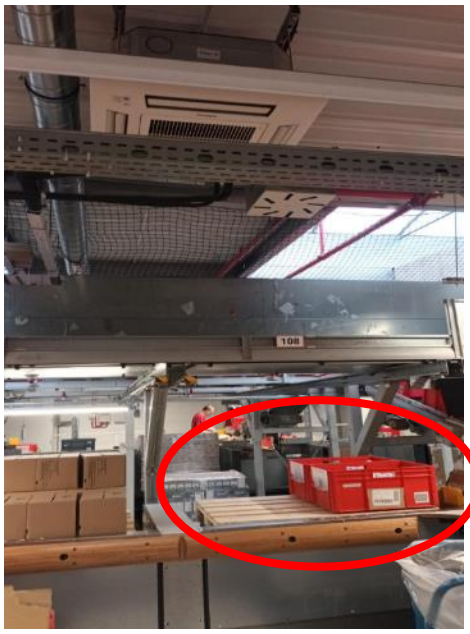
- In workbenches where there is a need to move loads, it is necessary to use elements that support their transport in the form of, for example, ball mechanisms.



- Workstations should be adapted to the physical and mental capabilities of employees and made in accordance with the Polish Standard (PN).

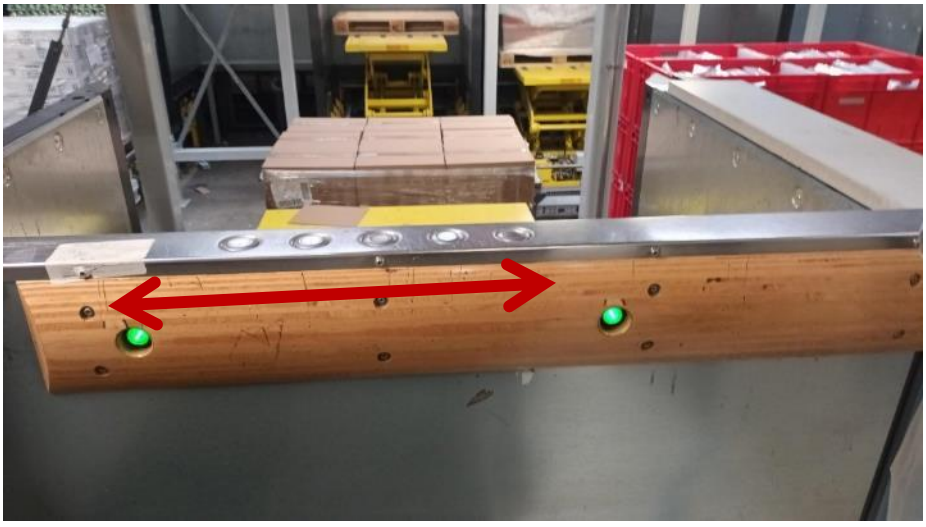


- The height of worktables should be designed according to ergonomic requirements, adapting it to the type and nature of the activities performed.



- The repacking station for bins should be organized so that the retrieval of goods from the pallet takes place from the side of the longer edge of the pallet.
- At the repacking station, it is necessary to use a solution that allows you to adjust the height from which the employee takes the goods to his physical and mental capabilities - adjusting the height of the table on which the pallet is placed.

Button distances - protection/crush zone



Regulation of the Minister of Economy on essential requirements for machines of 21st October 2008

- All buttons should be labelled/identifiable.
- Controls used by the operator should be located outside the hazard area
- Starting the process should only be possible by stimulating both manual control buttons simultaneously. Releasing at least one should cause the movement of the dangerous element (here: the lift table) to stop. The distance between the buttons should be greater than 260 mm.

- Controls at workstations where there is a crush zone should be designed and implemented in accordance with PN-EN ISO 13851:2019-05 Safety of machinery - Ambidextrous control devices - Principles of design and selection.

Evacuation from workstations

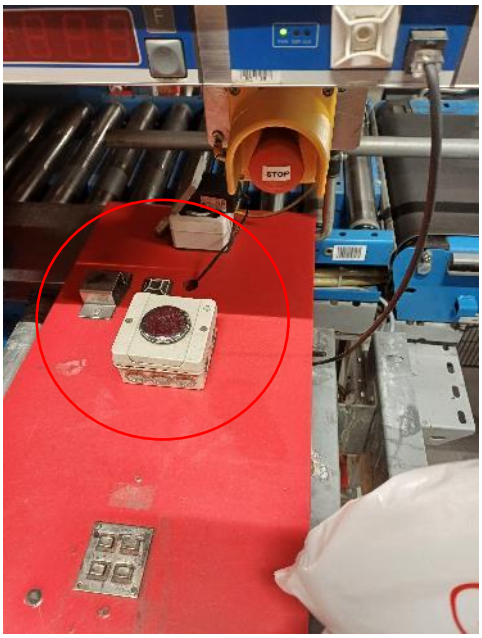


- In a standard workstation leaving situation, a control element should be provided to stop the movement of the bins on the conveyor during the transition.
- Blocking the possibility of the bins stopping on the elevated element of the conveyor. No buffering of bins on the lifting element, which will allow evacuation of workers in case of power disconnection.
- The lifted element of the installation must have a handle to ensure its convenient operation, i.e. raising / lowering.
- The lifted element must feature a solution intended for preventing the element from falling on its own when lifted upwards.

AKL picking of goods



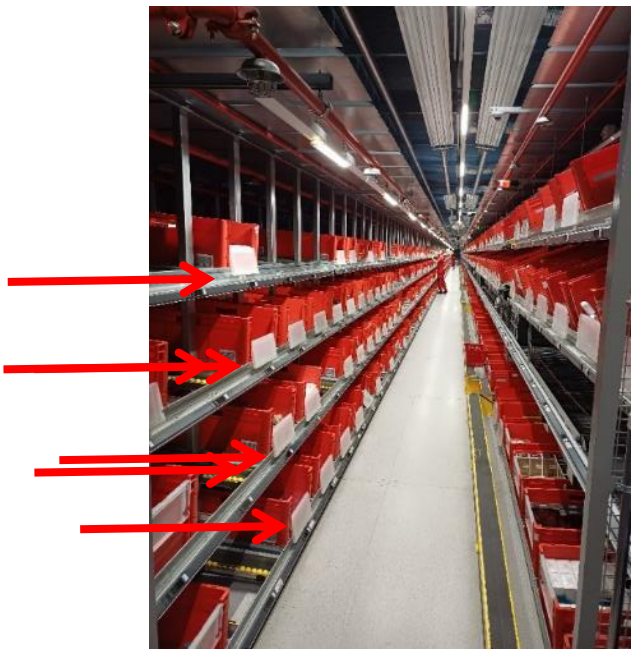
- A mechanical barrier should be used in the picking area to prevent containers from being placed on the roller conveyor outside the workstation.



- Provide a solution to dissipate static electricity at the AKL picking station

Regulation of the Minister of Infrastructure of 12th April 2002 on the issue of technical conditions that should be met by the buildings and their location

§ 305.
2. Floors and carpets in rooms intended for human habitation should be made of anti-electrostatic materials that meet the conditions specified in the Polish Standards for protection against static electricity.



- The shelves of the racks on which the picking bins are located should be extended / shifted horizontally with respect to each other, in order to ensure freedom of movement when picking goods from the bins.

- It is necessary to adjust the height and location of shelves of the shelving system to the physical and mental capabilities of a person and the principles of ergonomics.



- The use of an anti-slip step to facilitate access to the top level from which the goods are taken in AKL alleys while maintaining the appropriate width of the passageway.

Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations.

§ 45. The dimensions of the free surface of the workstation should provide workers with sufficient freedom of movement to perform work not only safely, but also with due regard to ergonomic requirements.

Organization of workstations

Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations.

Area and height of work premises

§ 19

1. The area and height of the work premises should ensure that the requirements of occupational safety and health are met, taking into account the type of work performed, the technologies used and the duration of employees' stay in these premises.

2. There should be at least 13 m^3 of free room volume and at least 2 m^2 of free floor space (unoccupied by technical devices, equipment, etc.) for each of the workers simultaneously employed in the premises of permanent work.

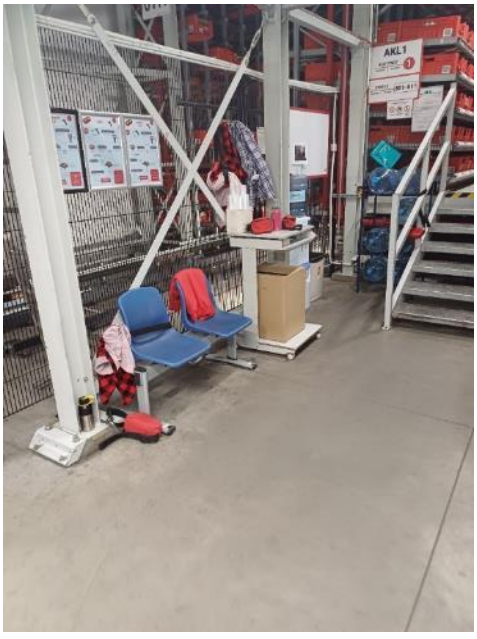
§ 45. Location of workstations**.** The dimensions of the free surface of the workstation should provide workers with sufficient freedom of movement to perform work not only safely, but also with due regard to ergonomic requirements.



- Provide space at workstations for materials necessary in the work process, such as waste containers, empty bins, etc.

Seats





Regulation of the Minister of Labour and Social Policy of 26th September 1997 on general occupational health and safety regulations.

§ 49 Obligation to provide employees with the opportunity to sit or rest in a seated position

1. When performing work that does not constantly require standing, workers should be provided with the opportunity to sit.

2. When performing work that constantly requires standing or walking, workers should be given the opportunity to rest near the work area in a seated position.

3. Seats should meet the requirements of the Polish Standards.