



THE BEST WAY TO...

Design of the workplace

How you lay out your shop and the fixtures and furnishings you decide influence whether your employees can lift, pull and push safely and avoid unnecessarily strenuous work.

A good layout allows space for employees to manoeuvre and get around with mechanical aids and use safe manual handling techniques.

Below are some guidelines for a good workplace layout.

[This PDF document contains more information about:](#)

- Transport routes
- Indoor traffic
- Space
- Room temperature
- Lighting
- Fixtures and furnishings

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TRANSPORT ROUTES

Make room for transport

Requirements for the width of transport routes depend on what needs to be transported, the transport equipment, and what is needed to allow for employees to maintain a good working position. As a general rule, you should allow for 30-50cm of free space on either side of the load being transported. Door and gate entrances should allow for approx. 20cm free space between the load and the doorway so that the load can pass through unhindered and there is room to manoeuvre the load.

Manual handling requires space. For example, when manoeuvring a pallet truck with one foot in front of the other, you need approx. 90cm of free space in front of and behind the doorway for yourself, plus the length of the pallet truck.

Ensure transport routes are safe

The transport routes in the shop area and stockroom must be stable, without holes and uneven surfaces, and they must not be slippery.

As far as possible, keep transport routes cleared of objects such as products, packaging and mechanical aids.

The same applies for outdoor transport; however, outdoor transport routes also need to be cleared for snow, ice and puddles, etc. Furthermore, any difference in level along the route which may cause accidents due to falling must be marked off, for example with yellow stripes on the ground.



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Ramps can be helpful

To minimise or entirely avoid carrying products on stairs, consider establishing fixed or temporary ramps, so that products can be transported instead. Such ramps must be at least 125cm wide.

When transporting heavy pallets by hand along ramps and other sloping surfaces, the slope must not exceed 1:50, corresponding to 2cm per running metre.

If the ramp is shorter than the distance between the front wheel and the back wheel of the aid, the slope may be 1:20, corresponding to 5cm per running metre.

INDOOR TRAFFIC

Be cautious in areas with both pedestrian and vehicle traffic!

Vehicle routes should be placed at appropriate distances to doors, gates and pedestrians. Vehicle traffic involves powered mechanical aids such as forklifts.

Vehicles and pedestrians should as far as possible be kept separate, not least where space is narrow. For example, use yellow stripes on the floor to mark boundaries between areas for walking and working, respectively. Where passageways are narrow, consider establishing guardrails to separate vehicles and pedestrians.

In areas with combined vehicle and pedestrian traffic and where products are handled at height, it's important to establish traffic rules, for example give-way rules, speed limits, permitted mechanical aids, and requirements for cordoning off areas where loads are being handled at height.

Prevent and protect against falling objects

Fixed work areas and access routes must be secured against falling objects from tall racking systems, etc., for example by installing rack decking or overhead protective structures, ensuring products are safely stacked or packed and that no products are sticking out or otherwise obstruct the transport route, etc.

Where loads are handled using a forklift truck, a pallet stacker, or similar, at heights above 2m, controls must be in place to keep people away from the work area. These can include rules making it clear to everyone where not to walk and stand while loads are being handled, for example signposting or physical barriers to prevent access to the area.

Ensure visibility and easy navigation

Where traffic routes have blind spots and limited visibility, for example at corners, and there is a risk of injury, install mirrors or similar so that people can navigate safely.



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SPACE

Make room for stocking

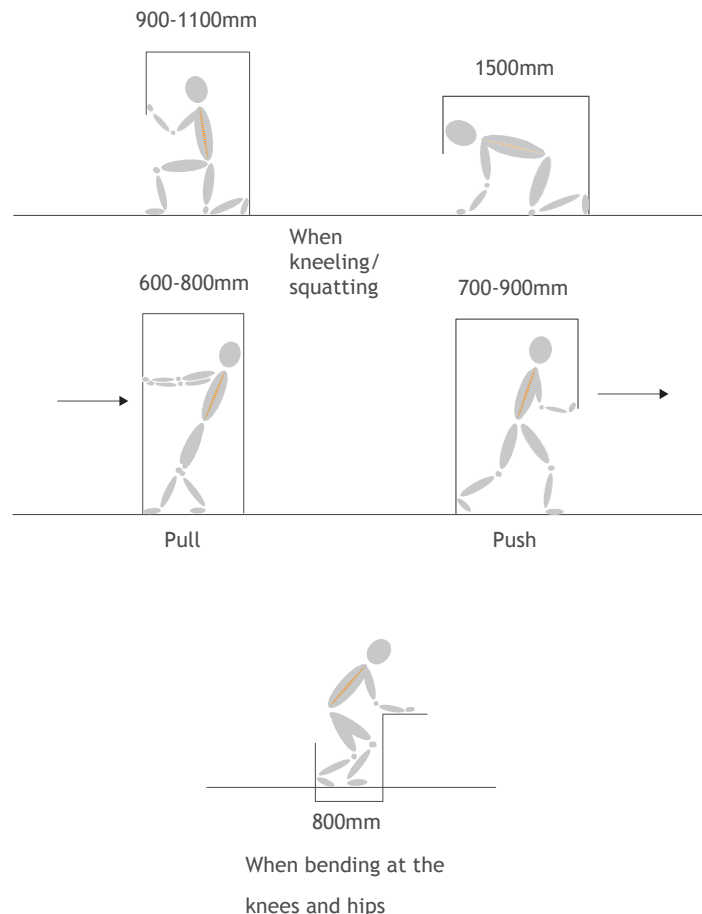
It's important to have space in front of shop furnishings such as shop shelving and refrigerated and frozen display furniture, so that employees can place any mechanical aid close to where the products need to go and have free access to the products on the transport equipment from three sides.

Similarly, there should be adequate space to maintain a good working position when stocking and organising shop shelves.

Safe manual handling requires space. In general, a person needs 1 x 1m free space for manual handling tasks, i.e. 1m at the front, back and on either side, so that there is space to move the feet, bend at the knees, move the shoulders freely and lift without twisting and turning the torso.

Work at low height, for example low shelves, requires 110cm free space at the front and back. For standing work, the requirement is between 75 and 90cm.

This is how much space is needed between a stock trolley/pallet and the shelves, etc.:





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TEMPERATURE

Set an appropriate room temperature

The room temperature during sedentary work, whether sitting or standing, and mildly strenuous work should be between 18-22°C. During medium and highly strenuous work, room temperature should not be below 15°C.

Temperatures down to around 10°C are acceptable under exceptional circumstances, for example in storage areas, goods reception or reserve stocks, where tasks are only performed occasionally and for shorter periods of time. Even lower temperatures may also be acceptable if the nature of the production process requires this or if lower temperatures have been set by the authorities, for example the food authorities.

Under normal weather conditions, the room temperature should not be higher than 25°C.

If the room temperature exceeds 25°C, measures should be taken to lower it. One such measure could be air conditioning, extra insulation of the building or solar shading.

If the room temperature at the workplace is above 32°C during hot weather, and the relative humidity is at 40-60%, employees performing physical work should have appropriate breaks away from the hot rooms. If the humidity is even higher, employees should be offered breaks away from the hot rooms, even at temperatures below 32°C.

Cold temperatures and draught prevention

Primary working areas of employees should be protected from cold temperatures or draught. Work in cold environments causes muscles and joints to cool down, which increases the risk of injury.

If gates and doors are opened/left open often due to extensive traffic, it's a good idea to install protective structures against the cold and draught such as plastic blinds or rolling gates to shield indoor working areas from direct exposure.

If cold temperatures and draught cannot be prevented due to temperature requirements for storing certain products, or in rooms where protective measures cannot be put in place, employees must have access to appropriate personal protective equipment and clothing (such as thermal clothing, windproof and waterproof clothing, etc.).



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LIGHTING

Put the spotlight on transport routes

Transport routes should be well lit so that employees can navigate properly and see other people, objects and any uneven floors, etc.

Artificial light intensity is measured in lux. The DS/EN 12464-1:2021 standard provides guidelines for minimum lighting requirements in indoor workplaces. The standard requirement for transport routes and on ramps is usually 50 lux. The standard can be obtained from the Danish Standards Association.

Put the spotlight on work areas

Often, a combination of general lighting and special lighting will be preferable to ensure appropriate lighting conditions for the work at hand.

For precision work and reading in work zones in the stockroom and in the shop area, the lighting requirement is 200-500 lux. If there are special requirements for colours and quality control, the colour rendering should be tailored to the task or activity at hand (choice of Philips code).

Let the daylight in

Permanent workstations should have access to natural daylight. For sidelight, the window area should correspond to at least 10% of the floor area to ensure good daylight access. For top lighting, the window area should be at least 7%.

Daylight access may be indirect (i.e. through several layers of glazing with air in-between, as in covered streets in shopping centres, for example).

Workrooms may be designed without daylight access if providing access to daylight or views outside would seriously harm the operations of the company.

Designing workrooms without daylight access in new-building projects requires the authorities' dispensation from the relevant provisions of the building regulations.

Prevent discomfort glare and reflection

Lamps and luminaires must be tailored and placed in a way that prevents discomfort glare and reflection.



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FIXTURES AND FURNISHINGS

Storage racking

In large stockrooms/warehouses with pallet racking systems and systems for storing individual items, the maximum permitted load must be indicated at the end of each aisle/rack or at regular intervals along the shelves, for example.

Racks and shelves must be undamaged and fitted with rack end protectors to protect against vehicle impact - either in the form of guards or tailored reinforcements.

Shelves must slope slightly inwards and be flat and they must be fitted with pallet stops/stop beams at the back of the rack to ensure pallets are always placed correctly. The racks must be bolted to the floor or together. Single racks can be used if they are bolted to the floor or ceiling.

If single racks are installed with free access space behind the racks, and if items are stored and retrieved from above two metres, there must be protection against falling objects, for example backstops on shelves, decking/barricading or overhead protective structures.

Pallet racks should preferably be fitted with pull-out shelves for collecting individual items from pallets to stock shelves in the shop or to retrieve individual items for distribution or for customers. Pull-out shelving comes in various designs and is useful for optimising storage capacity and for maintaining a good working position when retrieving items.

Smaller storage shelving for backroom storage, etc.

Smaller shelving systems must be installed on a stable base so there is no risk of them tipping over. Small but tall shelves should be bolted together with a crossbeam at the top to prevent a domino effect of falling shelves.

Make sure there is space to place a suitable mechanical aid, for example a stock trolley or table trolley, up close to the shelves to avoid unnecessary reloading and carrying products.

The shelves should be of an appropriate height and depth to allow for easy access, and they should be designed for the type of products at hand, for example with regard to product weight and size.

Reaching distances to the back of shelves should not exceed 45cm. Shelves above 160cm should be designed to hold only light products weighing less than 3kg to eliminate the physically strenuous activity of manually placing and retrieving products at height.

If a mechanical aid is used, such as a ladder or kick step, heavier products may be placed above 160cm. In general, however, heavier products should be placed on the bottom shelves with the heaviest ones placed between mid-thigh and elbow height. Lighter products should be placed on the upper shelves.

Shelves should be fitted with low-friction surface coating/material such as cardboard, vinyl, metal or other fixed and smooth cover to allow products to be slid and pushed/pulled instead of lifted, especially when handling heavy products. The harder the surface, the lower the friction.



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Shop shelving

Shelves should be of a height and depth that allow customers and shop employees easy access to stored items. Reaching distances to the back of shelves should be as short as possible and no more than 45cm.

Shop shelves should be organised with heavier products on the bottom shelves and lighter products on the upper shelves. As a general rule, the heaviest products should be placed between mid-thigh and elbow height. Shelves above 160cm should be designed to hold only light products weighing less than 3kg.

If there is a risk of products sliding and falling from shelves, a flexible shelf fence should be installed, which can be flipped down as required.

Shop shelves should be fitted with low-friction surface coating/material such as cardboard, vinyl, metal or other fixed and smooth cover allowing for products to be slid and pushed/pulled instead of lifted, especially when handling heavy products. The harder the surface, the lower the friction.

Refrigerated and frozen display furniture

Refrigerated and frozen display furniture should be of a height and depth that allow customers and shop employees easy access to the stored items.

Reaching distances to the back of shelves should be as short as possible and no more than 45cm. For example, refrigerated and frozen fixtures/furniture with a base that is broader than the top can be loaded from the rear to ensure short reaching distances.

Similarly, floor mounted bumper rails on wide refrigerated and frozen display furniture allow employees to stand closer to the furniture, enabling shorter reaching distances.

Tall refrigerated and frozen display furniture should be organised with heavier products on the bottom and lighter products at the top. As a general rule, the heaviest products should be placed between mid-thigh and elbow height. For example, dairy coolers can be organised so that milk crates and similar can be transported directly into the cooler, thus avoiding manual handling altogether.