

Ergonomics in practice

– Manual palletizing –

Manual palletizing tends to be a very stressful activity that arises in almost every company. The loads to be handled can range from a few kilos to boxes weighing over 20 kilos, which are often palletized or depalletized several hundred to over a thousand times per shift. If the hand palletizing workplace is not ergonomically designed, workers can be exposed to high physical stress – and consequently a high risk for injuries and musculoskeletal diseases.

The best way to [assess the stress](#) during palletizing is to use the key indicator method “Lifting, Holding, Carrying”. The form with explanations and an integrated calculation aid can be downloaded from the BAuA website. In order to eliminate high stress and to improve working conditions, the following measures are recommended.

Ergonomic design of manual palletizing stations

[Choose an optimal height for the infeed or removal belt.](#) The correct working height when grabbing and setting down is of great importance! Workers should be able to grab the product at a height that is ergonomic for them – when standing, this is approximately at the level of the navel. For this purpose, set the height of the infeed or removal belt to approx. 85–115 cm, depending on body height and grabbing conditions of the products. Ideally, the height of the belts

can be adjusted easily and without tools to the needs of the respective employee.

[Use palletizing aids](#) in order to avoid particularly stressful bending forward as well as lifting above shoulder height. If a palletizing aid that can be lowered into the floor is used, the employees can continuously grab the products from the pallet or set them down at a height that is ergonomic for them.



If it is not possible to use a palletizing aid that can be lowered into the floor, make sure to use a scissor lift table or trolley. This avoids deep bending when depalletizing/palletizing the lower pallet layers.



[Reduce the pallet stack height.](#) If it is not possible to use a palletizing aid that can be lowered into the floor, it may be useful to reduce the maximum pallet stack height – e. g. to a maximum of 1.20 metres. There is no need for stressful lifting above shoulder height. However, more storage space may be required.

[Enable lifting and carrying close to the body.](#) The reaching distance should be kept as short as possible. Employees should always be able to step close and unhindered to the products to be grabbed. Create the necessary clearance for movements at the workplace.

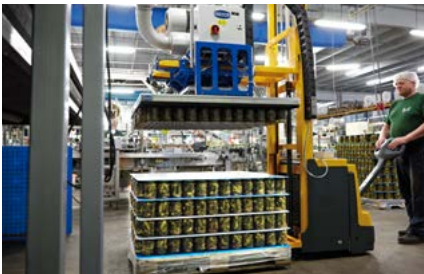
[Reduce the carrying distance and torso rotation.](#) Arrange the pallet closer to the conveyor belt that long distances and torso twists are avoided as far as possible during lifting.



Workers should be able to perform a necessary torso rotation over the left or right side (e. g. alternating with each pallet). If a height-adjustable palletizing aid is used, the load can be pulled directly from the conveyor onto the pallet if necessary.

Workplace mats can be used if manual palletizing always takes place at the same place. The mats reduce the stress on the feet and legs and the fatigue of the trunk muscles when standing.

Use lifting aids for lifting heavy or bulky products. Examples are electric lifting aids or vacuum lifters. In some circumstances, adapted lifting aids can be used to palletize several products at the same time. The illustration shows a vacuum lifter that enables palletizing a whole layer of glasses at once.



Lift heavy loads in pairs. Boxes filled with products quickly weigh up to 20 kg and more. If a lot of boxes are lifted per day, the load should be divided between two people.

Pay attention to the number of lifts per person. In times of peak loads, engage additional workers to the manual palletizing to keep the number of lifts per person at a reasonable level.

Organise a rotating assignment of manual palletizing. By job rotation you avoid one-sided stress on the employees. It is recommended that an employee, e. g. after half of the shift, changes to another workplace where the back and arms are subjected to less or different stress.

Instruct your employees to adopt ergonomic working techniques and monitor them time to time. Ensure that employees are trained in back-friendly lifting and carrying methods and correct use of work equipment. Interdisciplinary training aids, instructional videos and technical articles are available on the BGN website in the media shop.

Recommend the performance of compensatory exercises. Even if the workplace is ergonomically designed, frequent repetitions put a one-sided stress on the body. As a countermeasure, it is advisable to propose short compensatory exercises and to improve their regular performance.



Care for ergonomic conditions. In addition to workplace related adaptations ensure an ergonomic working environment. Important attributes such as room dimensions, traffic routes, climate, noise, lighting and work organisation factors must be taken into account.

Use the risk assessment to systematically identify and eliminate ergonomic hazards. For this purpose, the specific work situations must be considered, evaluated and documented.



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