Ergo in Design: Manual Palletizing Best Practices

Since the early 1900’s, pallets have been essential to the efficient distribution of goods across nearly all industries. From warehouses to construction sites and retail businesses, pallets are the preferred means of storing and shipping products. While forklifts and pallet jacks have likely prevented many injuries within your organization, the task of manually loading and unloading materials to and from pallets could result in an employee being injured.

Factors that typically contribute to the cause of an employee injury while performing manual palletizing tasks include:

- Poor posture while handling materials being palletized (bending, reaching, kneeling and twisting)
- High repetition (varies by the number of units per pallet and the duration of work shift that the employee performs manual palletizing tasks)
- Manual handling of heavier materials being palletized (material weight exceeding 50lbs is inherently unsafe; no matter if the pallet is at an employee’s waist height or at floor level)
- Slip/Trip/Fall hazards (e.g. shrink wrap, loose pallets on the floor, tight aisle ways between pallets)

Like all other hazards you may encounter at your organization, the hierarchy of controls should be utilized to prevent employee injuries when performing manual palletizing tasks.

ELIMINATE HAZARDS

Through automation, employee exposure to injury from manual palletizing could be eliminated. Below are a few examples of vendors and systems of automated palletizing equipment:

- Bastian Solutions  
- FANUC Palletizing Robots  

ENGINEERING CONTROLS

If automated palletizers are not a feasible option for your organization, there are a variety of engineering improvements that would significantly improve the ergonomics of manual palletizing tasks. Below are a few examples of vendors and products. To prevent employees from having to bend, kneel and reach, it is ideal to keep the height of the pallet or row of materials being stacked at or near waist height and within close reach. Below are a few engineering options for offering height adjustability while palletizing:

- Manual palletizers  
- Lift tables  
  [https://www.liftproducts.com/lifttables.html](https://www.liftproducts.com/lifttables.html)
- Pallet jacks that lift/tilt  

Manual stretch wrapping of loaded pallets can also lead to employee injury by requiring them to bend and reach while pulling on the roll of the wrapping, see picture. Below are different products that help improve engineering controls of this task.
Automated stretch wrappers  
https://www.lantech.com/stretch-wrappers?region=1

Portable, automated stretch wrapper  

Stretch wrap handles  
https://www.uline.com/BL_703/Heavy-Duty-Handwrapper

**ADMINISTRATIVE CONTROLS**

When elimination and engineering controls are unable to be implemented, the last line of defense are administrative controls or altering the way employees perform palletizing tasks. Below are examples of different administrative controls to reduce potential employee injuries while manually palletizing.

- Height of the conveyors is dependent on the size of the materials being handled and should be set to maintain an optimal waist level height for the handled materials.
- Limit the height of stacked materials on pallets. Ideally the height of the top row should not be taller than an employee’s shoulder height and should never be over the head of the employee.
- Paint lines on the floor for dedicating spaces for pallets. Maintain wide aisle ways between lines, no less than 36” for worker access and clearance. You must also factor in clearances for fork trucks and any other equipment in addition to your workers.
- Choose packaging that provides handles or holes in a box for grip.
- Stack pallets underneath the one being built in order to keep the material handling closer to an employee’s waist level.
- Utilize a work rotation schedule that provides employees time to rest and recover when repetition of manual palletizing tasks is high, e.g. palletize for 4 hours and then perform fewer physical tasks for the remaining 4 hours of the shift.
- Based on a hazard assessment of palletizing tasks, safety toed footwear may be needed. If the weight of the material being handled while palletizing could cause an injury if it were to fall and land on an employee’s foot/toes, then safety toed footwear should be worn.

Note the narrow aisles between pallets in this picture. This results in awkward postures (twisting/reaching) due to limited space for the employee to move their feet. Aisles between pallets should have a minimum width of 36”