

Load and Ride Solutions Loading Assistance

Unitizing Loads - Carload Movements

Definition and Purpose



Lumber unitized with banding

Unitization is "to assemble a group of parts, products or packages into an appropriate unit for handling by mechanical equipment." (Source: AAR Pamphlet No. 41.)

Unitizing product(s) is an efficient means of handling, storing, and transporting lading, which contributes to efficient utilization of equipment and storage space. Products such as case goods, bagged products, bales, drums, and lumber can be unitized; stowed on pallets, slip sheets, or skids, which offers the best stack stability in unitized loads. A well-prepared unitized load will maintain good vertical alignment during rail transportation and help eliminate handling problems and lading damage.

Various Unitization Methods

Spot Gluing

Spot gluing is applying a small amount of sticky liquid (glue) to individual packages of a unit to hold adjacent layers in place. Tight loading is essential to maintain the stability of the load. Spot gluing is primarily used with bagged and baled shipments.

Strapping or Banding

Strapping is a metal, plastic, or polyethylene band used to hold a variety of products together in a unit. Strapping is primarily used with bulk/high density products such as lumber, ingots, and coils.

Shrink Wrapping

Shrink-wrapping is a packaging process that releases polypropylene fibers/strands in a plastic film/wrap by raising the temperature/heating the film/wrap. As it cools, the wrap shrinks and more closely fits the contents of the package. Shrink-wrapping is primarily used on case good shipments but does not have widespread use because of the popularity of the stretch wrapping method on the next page.

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Stretch Wrapping

Stretch wrapping is a process that unitizes product with a minimum of 1 mil, low-density polyethylene wrap encompassing all layers of the unit including encircling pallet base with three to four wraps. Stretch wrapping can be applied by hand or by machine and is primarily used with palletized/slip-sheeted loads such as case goods, fiberboard cases, and bagged/baled shipments.



Bagged product unitized with stretch wrap, loaded on pallets three high with a DID bag in the center void.

Stretch wrapping is the most common unitization method in securing loads. When possible case goods and bag products should be unitized onto pallets/slip sheets. Stack the lading in a bonded block or other interlocking pattern and eliminate all voids within the unit. Maintain good vertical alignment of the unit by using one of the securement methods depicted in this loading assistance bulletin.

Pallet Overhang and Underhang

Lading should be loaded to eliminate product overhang or underhang. Overhang is the "portion of the unit exceeding the length and/or width dimensions of a pallet" (AAR Pamphlet No. 41) and can reduce the effectiveness of the unit; create difficulty in loading, unloading, storage, and lead to damage. Underhang is when "shipping containers are placed on a pallet which do not occupy the entire platform area of the pallet, leaving a void space either lengthwise and/or crosswise. No underhang on pallets is allowed lengthwise of a rail vehicle unless filler material is used to fill the void space." (AAR Pamphlet No. 41.) Loading product covering less than 100 percent of the pallet/slip sheet surface can result in product shifting and lading damage during normal railroad transportation.



Example of pallet overhang