

Plastic Drum Stacking Guidelines

This guideline presents general advice on stacking 55-gallon UN rated closed-head (1H1) and open-head (1H2) plastic drums. Your drum manufacturer or drum re-conditioner can help evaluate your situation.

Safety

Safety and preventing spills are first priorities. The correct forklift to use has an overhead guard, sideshift and well-spaced, pallet-length forks. Store stacked drums in non-pedestrian areas. Do not move full drums while they are stacked.

Common Influences on Successful Drum Stacking

Ideal Conditions

- Level concrete floor, free of any objects such as rocks, sticks, pipes, etc.
- Proper double-faced pallets (top and bottom deck boards) in good condition. For a recommended pallet design, see Diagrams A, B and C.
- Drums should be properly closed per manufacturers closing instructions.
- Temperatures in the storage area do not exceed 90°F.
- No exposure to direct sunlight.
- Drums are UN-rated and the contents are well within the type and specific gravity rating on the drums.
- Drums and contents in a stack are all the same.

Factors that Lower the Recommended Stack Height

- High temperature environment, exceeding 90°F for extended periods.
- Drums that are filled to less than their nominal rated capacity.
- Stacked drums that are exposed to direct sunlight for extended periods.
- Drum closures that are fitted with pressure relieving vents.
- Improper hot filling. Hot-filled drums must be allowed to cool to ambient temperature before stacking. Drums must be vented while cooling. Do not tighten the plugs until ambient temperature has been reached. Cooling hot-filled drums typically takes a minimum of 24 hours. Filling drums with liquid in excess of 150°F can irreparably damage the structural integrity of the drum.
- Contents stored that are known to induce environmental stress cracking in polyethylene. Stress cracking agents come in many varieties, ranging from aqueous solutions of surfactants to pure solvents, and from simple hydrocarbons to silicone oils.
- Drum contents that have a specific gravity of 1.5 or higher. Use high-strength pallets to stack heavy liquids.
- Forklift or operator limitations. Stacking drums requires proper equipment and experience.

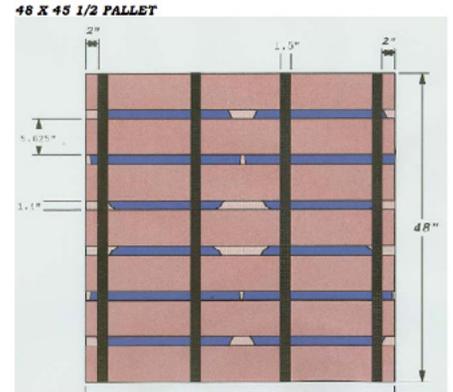


Diagram A: Pallet design 1 for UN1H1 and UN1H2 plastic drums.

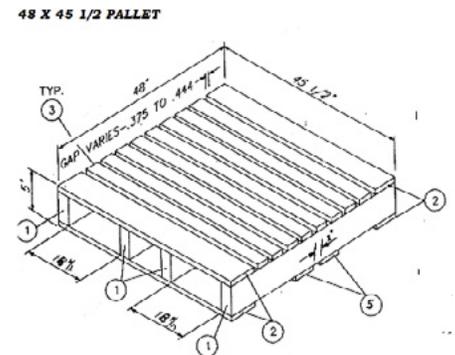


Diagram B: Pallet design 2 for UN1H1 and UN1H2 plastic drums.

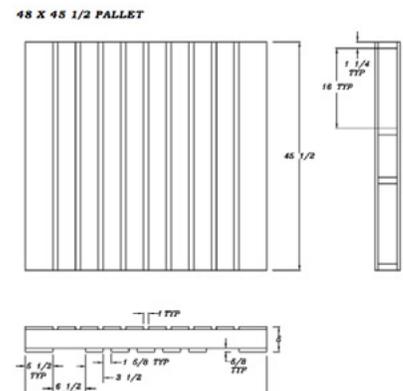


Diagram C: Pallet design 3 for UN1H1 and UN1H2 plastic drums.



Diagram D: Pallet stacking



Diagram E: Column stacking



Diagram E: Pyramid stacking

Pallet Stacking (Diagram D)

Insufficient and broken pallets must be avoided. Pallets and drums must be vertically aligned in the stack, and drums must not overhang pallet edges.

Four-high: Four-high stacking (sixteen drums, four per pallet) is only recommended if conditions are ideal and all other factors have been considered. A single negative factor will limit the stack height to less than four-high.

Three-high: The typical maximum stack height for full plastic drums is three-high.

Two-high: The severity of a negative factor, or a combination, can reduce the stack height to two-high.

Column Stacking (Diagram E)

Column stacking requires full $\frac{3}{4}$ inch plywood boards between drums. The typical maximum stack height for column stacking is two-high.

Pyramid Stacking (Diagram F)

Pyramid stacking requires drums that have a bottom footing or $\frac{3}{4}$ inch plywood boards between drums. The typical maximum stack height for pyramid stacking is two-high.

Horizontal Drum Storage

Filled drums stored in a horizontal position should not be directly stacked. Each horizontal drum must be supported individually. The support should be along the length of the each drum, at the middle, as well as at both ends.

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