



PLASTIC
DRUM
INSTITUTE

Plastic Drum Stacking Guidelines

This guideline presents general advice on stacking 55-gallon UN rated (1H1) closed-head and (1H2) open-head 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

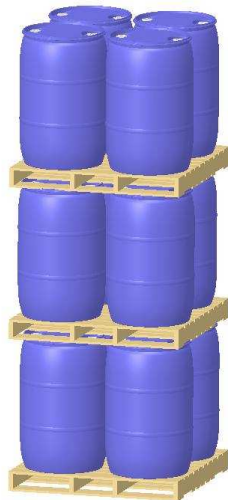
- Level concrete floor, free of any objects, such as rocks, sticks, pipes etc.
- Proper double-faced (top and bottom deck boards) pallets in good condition. For a recommended pallet design, see the attachment in this section.
- Drums should be properly closed per manufacturers closing instructions
- Temperatures in the storage area do not exceed 90 degrees 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 degrees F for extended periods.
- Drums that are filled to less than their nominal rated capacity
- Stacked drums are exposed to direct sunlight for extended periods.
- Drum closures 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 degrees F can irreparably damage the structural integrity of the drum.
- Contents stored 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 oils¹.
- Drum contents 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.

Stacking configurations and heights:



Pallet Stacking

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

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



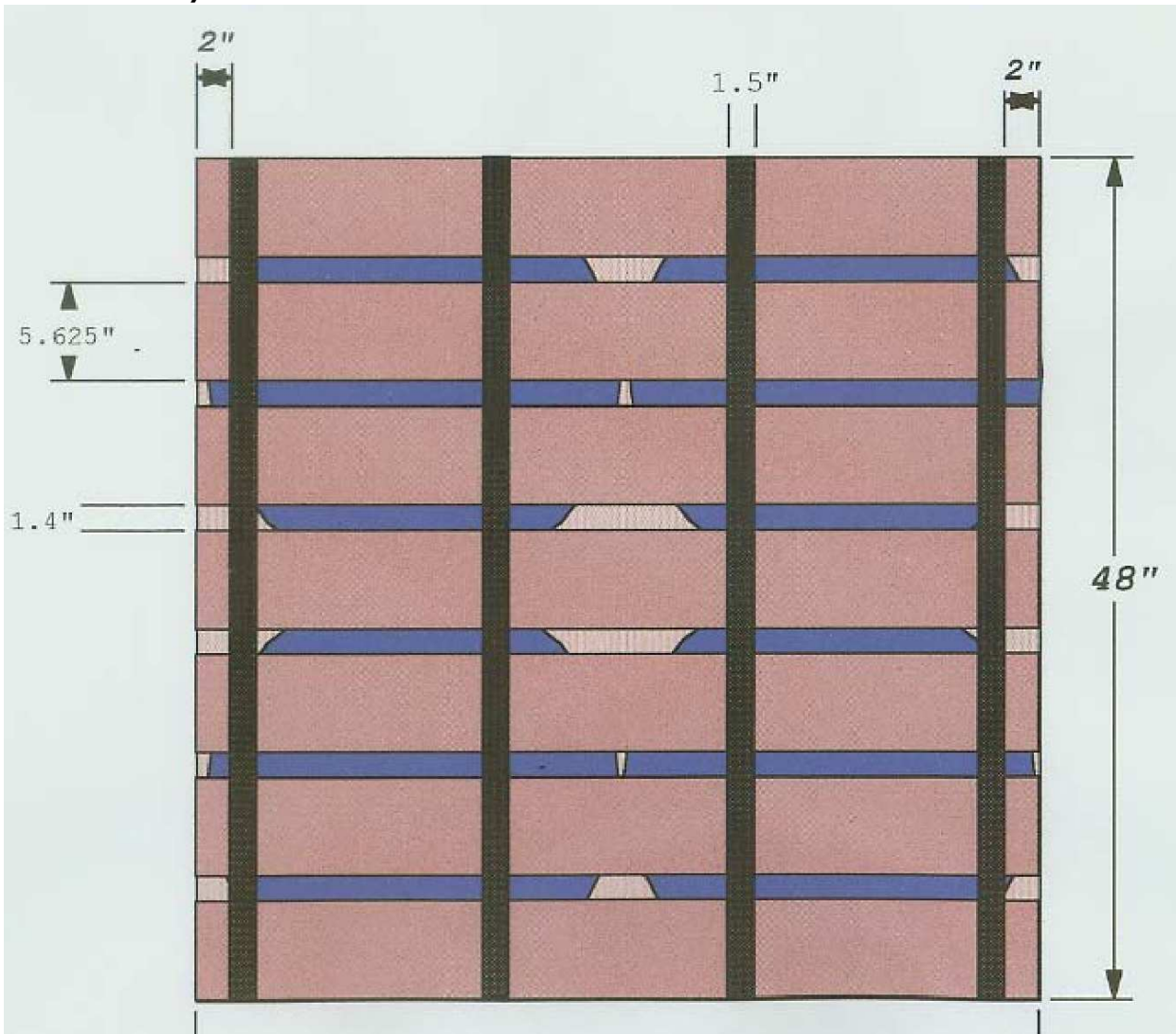
Pyramid Stacking

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

Horizontal Drum Storage

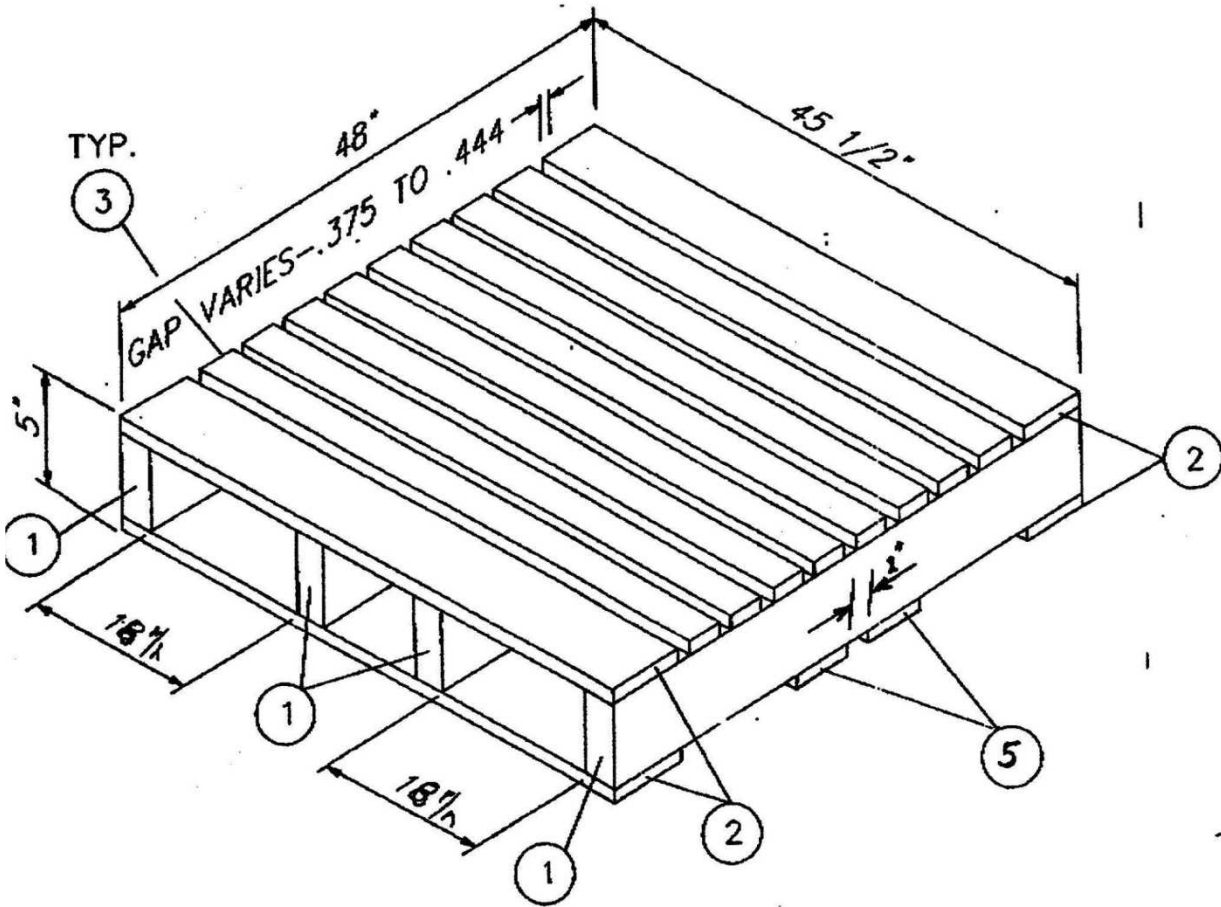
Filled drums stored in a horizontal position should not be directly stacked. Each horizontal drum must be supported individually. The support should be along the length of the each drum, at the middle, as well as at both ends.

48 X 45 1/2 PALLET



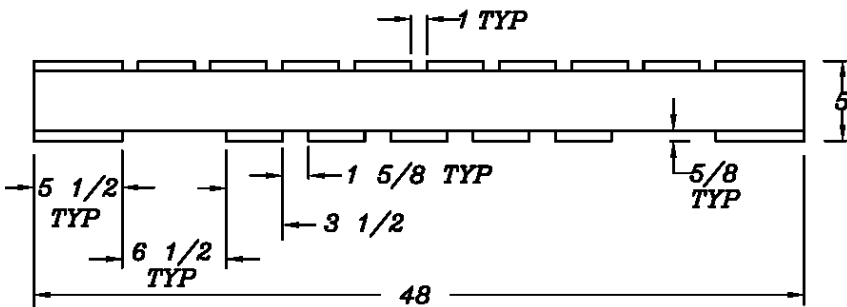
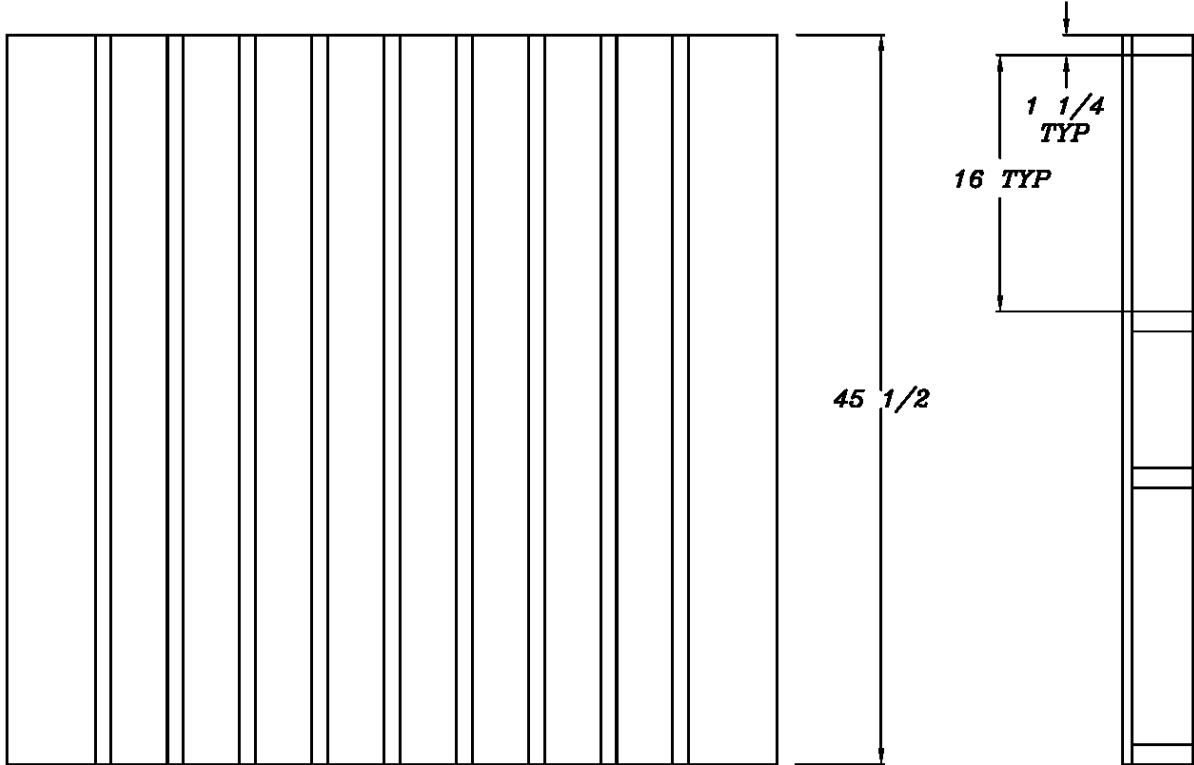
Plastic Drum Pallet UN 1H1 and UN1H2 – design 3

48 X 45 1/2 PALLET



A Pallet design for Plastic Drums – UN 1H1 and UN1H2

48 X 45 1/2 PALLET



Pallet Drum Pallet – UN 1H1 and UN 1H2 – Design 2

Disclaimer: TERMS OF USE: *By using this document, you signify acceptance of all terms, conditions and notices posted on PDI's website, www.plasticdrum.org, which are incorporated by reference herein. Please note, in particular, that all materials prepared or endorsed by PDI are for general informational purposes only and shall not be construed as legal or other professional advice. PDI makes no warranty of any kind including, but not limited to, the accuracy, reliability or timeliness of any content. Under no circumstances shall PDI be liable for damages of any sort that may result, directly or indirectly, from use of or reference to any such document or materials.*

www.plasticdrum.org