How to Determine Safe Stacking Heights



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1. OSHA’s standard 1917.14 states that: “Cargo, pallets and other material stored in tiers shall be stacked in such a manner as to provide stability against sliding and collapse.”
2. NFPA (I don’t recall the standard number) states that, due to fire concerns, empty pallet stacking be limited to 15 feet.
3. The Civil Aviation Authority of Singapore specifies that the stacking height of goods in palletized rack storage should not exceed 6.0 meters in height.
4. The *Asia Food Journal*finds that stacking height also affects the package performance, and over time high humidity, storage time and stacking height can all erode the integrity of a stored package. Two proposed solutions are:

   - Reducing the stacking height; or
   - Use of a Bliss box for extra strength, which will allow packages to be stacked even higher.

5. Canadian OHS laws: Each province, territory and federal OHS regulations include specific requirements regarding safe stacking heights.

Factors that Affect Stacking Height

What’s a safe height to stack materials? If one of your workers asks you this question, your answer must be: “It depends.” It may not be the most satisfying response, but it’s the truth.

To determine a safe height, you need to address these questions:

- What are you stacking?
- What kind of container is it in?
- What is the gross weight of the package?

- How many packages can be stacked on top of one another before the bottom fails?
- What is the loading capacity of the floor? The deck? The shelving?
- What are the temperature and humidity conditions for storage?
- How will these conditions affect the packaging? The product?

You also need to consider safety and ergonomic issues:

- How will the package be handled—by hand or with equipment?
- Will the stack have to be broken down by hand?
- If so, will the employee have to reach overhead? Repeatedly?
- If a package falls from a height, how hazardous is it if it hits an employee on the head, the shoulder? With or without a hand hat?

Next is the AHJ—Authority Having Jurisdiction and building codes:

- Will the AHJ allow you to store that much material in your space?
- Is there a hazard to storing that material?
- Do you need fire wall separations?
- Do you need special ventilation?
- Do you need classified locations and explosion-proof wiring and fixtures?
- Do you need XP materials handling equipment?

Conclusion

Just like for PPE, you need to perform a hazard assessment to determine the answers. If you’re purchasing products, ask the manufacturer what their recommendation on stack height is. If you’re the manufacturer, you will need to do some actual tests to make that determination.