

Choosing the right material handling system #7: What safety factors do you need to consider?

What is the best material handling system for your needs? That's a confusing and often complicated question to answer. To ease the process, we've segmented that big question into a series of seven simpler questions that each help to eliminate undesirable options.

1. [How much does the load weigh?](#)
2. [How maneuverable and flexible does the system need to be?](#)
3. [How far and how frequently does the load need to move?](#)
4. [How much does the move system cost?](#)
5. [How do you make the load "loadable"?](#)
6. [What training and certifications are required?](#)

Today, we're looking at the last – but definitely not least – question in this series: **safety**.

By this point in this series, readers have probably already taken many material handling systems off the table as serious options. For example, if the load is light and travels only short distances between stations, you may have already eliminated the options that would be overkill, like cranes or even forklifts. But there's one more dimension to consider before choosing between any remaining options.

The safety aspect of any material handling system has several dimensions. It's important to look at how safe is it for (1) operators, (2) other workers in the vicinity, (3) the load being moved, and (4) the facility in which the move is taking place. Potential risks include:

- **Falling loads.** Cranes, forklifts, and even some conveyor systems can potentially drop heavy loads onto workers below. This can cause injury or worse to workers; it can also result in serious damage to the load and/or the facility itself. In general, keeping heavy loads closer to the ground is preferable when it's logistically feasible. The fall doesn't have to happen from a high height to be dangerous, either. A load lifted by a forklift might only be a few inches or a few feet in the air, but if imbalance causes the load to tip over, it can be just as dangerous. **Best remediation:** anything that keeps the load balanced and close to the ground, including rails, conveyors, air casters, and some wheeled vehicles.
- **Tripping hazards.** Even keeping loads low can create a different set of hazards. Something like rails or drag chains built into the floor or at floor level can easily create tripping hazards, for example, if workers are distracted when trying to cross such systems. Even rails designed to be flush with the floor surface can be problematic if people trip on the narrow gap, or if debris gets stuck in the gap and sticks up. **Best remediation:** anything that doesn't leave a permanent fissure, gap, lip, crevice, or low-profile structure, like wheeled vehicles, cranes, air casters, etc.
- **Collisions.** Any material handling system that maneuvers through a facility runs the risk of colliding with people or other objects in the facility. However, the risk isn't the same for all systems. A wheeled vehicle traveling at speed is going to do more damage than something like air casters being manually maneuvered. Any system that might compromise visibility is also at increased risk of collision (e.g., blind spots associated with a wheeled vehicle). **Best remediation:** cranes work well here because they typically lift the load above collision height (while creating new falling risks), but some permanent installations, like conveyors or drag chains, can also minimize the risk of collisions.
- **Ergonomic injuries.** Some material handling systems require more human force to move than others. For example, a pushcart relies on human power, and that can increase the risk of strain, exhaustion, and

ergonomic problems like back injuries. Air casters work well here: they enable the precise maneuvering possible with human-powered systems but, because they virtually eliminate friction under the load, even a single person can easily move a multi-thousand-pound load easily. **Best remediation:** any system that does not rely on the operator to exert undue force, meaning anything other than push systems (with the notable exception of air casters).

- **Jarring or vibration.** Don't undersell this risk, especially the risk of damage to the load itself! If the material handling system transmits shock loads to the object, machinery, or equipment being moved, it can potentially cause damage. This is especially true for sensitive and delicate equipment (e.g., aerospace equipment or semiconductor processing equipment). **Best remediation:** nothing beats air casters here; the same film of air that floats the load from one location to another also helps to prevent vibration and shock loads from affecting the load.

What are the safest move systems?

This question is deceptively difficult to answer because it depends on the specific circumstances. That said, in general, air casters, rails, and conveyors are probably the lowest risk systems to use overall. They typically keep loads close to the ground (eliminating risks associated with height and falling), can move at controlled speeds, and eliminate or minimize risk of collisions (as long as spotters are used in conjunction with air casters).

Cranes and forklifts are probably among the riskier move systems. They can be very efficient, but there's just no getting around the risk of dropping, running into people or objects, and the ordinary risks associated with operating heavy machinery. There's a reason why forklift and crane operators must be certified!

For a deeper and more extensive look at safety considerations, please see our white paper "[Selecting the right load handling equipment.](#)" There, we examine each material handling system for its safety implications. We also assess six other questions that organizations need to ask to pick the right load handling system. Download the paper [here](#).