Roll Handling with Air Casters

Precisely maneuver and position rolls without damaging the product.

1

Ease roll handling processes by leveraging the power of air.

Air casters can make handling paper rolls a breeze by reducing overhead in current roll handling procedures.

Efficient operations at paper production and processing facilities rest on nimbly maneuvering massive paper, tissue, and corrugated rolls throughout the plant.

This is no trivial task: these rolls can easily weigh thousands of pounds and come in a variety of odd shapes and sizes, and some of them are delicate enough that casual handling could damage the product itself. Indeed, roll handling processes can be troublesome, as they may:

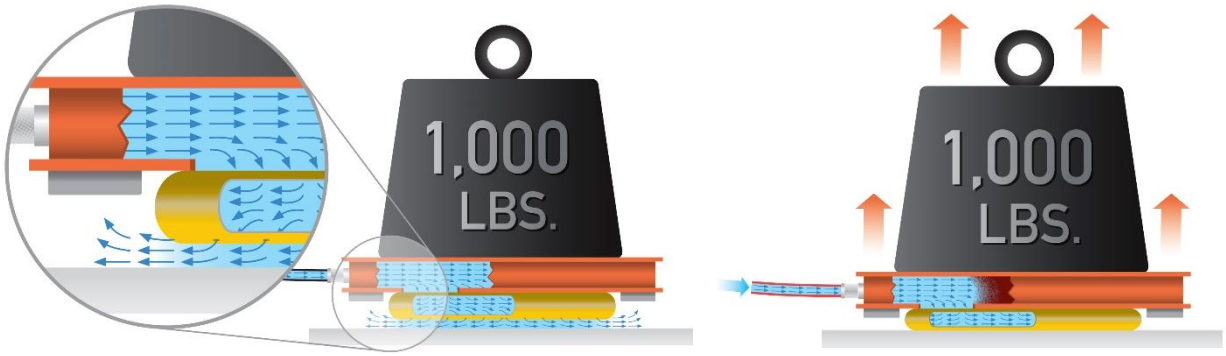
- Offer opportunity for workers to be hurt or for rolls to be damaged.
- Generate unnecessary downtime for equipment while rolls are being moved around.
- Require specialized laborers (forklift operators, strong enough workers) before moving.
- Create operational inefficiencies and unnecessary expense in handling rolls.

Enter air casters. Roll handling systems based on air casters harness the power of compressed air to literally float rolls on a thin, nearly frictionless film of air. That allows users to move them at a touch without damage to the rolls or processing equipment, and without damaging facility floors. Ideally suited for recurring load movement, emission-free air caster systems are a proven method to smoothly and precisely move rolls in confined spaces. But how do air casters work, and just how well can they accommodate the heavy weight and unwieldy shapes of rolls?

The AeroGo Rollmaster™ can easily maneuver even multi-ton paper rolls.

2 How do air casters work?

Air casters float rolls on a thin film of air, enabling nearly frictionless maneuvering in any direction such that a single operator exerting 5 to 25 lbs. of force can easily move and precisely position a 5,000 lb. load.



Air caster systems use compressed air (as depicted above) to inflate an air caster bag beneath the load being moved. As the bag fills, it lifts the load slightly. Once the bag reaches capacity and offsets the roll's weight, air evenly leaks between the bag and the floor until a thin (0.003" to 0.005" thickness), nearly frictionless film of air forms.

The load then literally floats atop this layer of air. From there, the load – much like a puck on an air hockey table – can be maneuvered in any direction with relative ease, thanks to a friction coefficient of around 1%. The low friction, combined with the air casters distributing the weight of the load evenly over the floor surface, protects floors from damage like divots, grooves, and ordinary wear-and-tear. Compare the floor loading of air casters at around 25 psi to the loading imposed by wheeled casters, which can equal 2,000 to 5,000 psi. **The specific number and size of air casters needed will vary according to the size, shape, and weight of the roll.** Standard plant air above 90 psi is sufficient in most cases. Even better, air caster systems can accommodate awkwardly sized paper rolls and come in a variety of form factors that can be matched to the roll and situation, as described in the table below. See Section 5 for a more detailed breakdown of the different types of air caster-based roll handling equipment.

Rollmover™	With two detached pieces that can be positioned around the rolls, the Rollmover™ can lift rolls directly from the floor while adjusting effortlessly to variable widths.	
Rollmaster™	The Rollmaster™ slides under/around rolls and then lifts them up. An added handle with fingertip controls gives operators more power and control over the load and load management.	
Air Pallets	Air pallets work like regular pallets but move much more easily since they are floating. Instead of being totally square and flat, they're shaped with angled chocks to ensure rolls fit and settle.	
Custom	Specialized designs can be purpose-built to accommodate specific scenarios or needs. Air casters can also be integrated into specialized paper processing equipment.	

3 What are the benefits?

Air casters offer the ultimate mobility option, enabling paper production plants to easily relocate and reposition even the most unwieldy rolls while reducing overall production costs.

Space-friendly

Air casters are highly maneuverable, turning 360° within their own footprint. Further, air casters *fit* within their own footprint, so they enable their loads to work seamlessly with cranes, mandrels, or spindles, while fitting into tight spaces easily. Air caster systems can also be customized to meet exact positioning requirements.

User-friendly

A single person can safely move/control loads up to 5,000-lbs with little risk of operator fatigue. The air casters are also low profile, eliminating the risk of the loads crushing toes or falling onto people from a height. Operation requires no certification, and training is minimal. Air casters produce no hazardous fumes when used with a clean air source.

Roll-friendly

Air caster systems can accommodate a variety of roll widths and diameters and staging situations. They also minimize damage to the rolls. Air caster systems with handles also enable operators to move the roll without ever touching it.

Floor-friendly

Air casters distribute the weight of a load over a large area to achieve low floor load levels and generate virtually no friction. Not only does reduced load minimize normal wear-and-tear, it offers the best and most effective method to protect expensive surface treatments and specialty floors.

Operations-friendly

Air casters can reduce plant downtime compared to cranes, lift trucks, rollers, or wheel systems. They fit smoothly into existing processes and offer clean and quiet operation.

Facility-friendly

With no moving parts, operating using standard shop compressed air, and no electrical or other power connections beyond an air hose required, air casters are extremely low maintenance.

Summary comparison of roll handling methodologies

	Description	Advantages	Disadvantages
Air Casters	Air casters lift loads on a thin, frictionless film of air so that the load is floated and can be easily pushed in any direction.	• Low risk of roll or machine damage • No floor damage • Can accommodate oddly sized rolls and almost any weight • Variable move path • Rotates within its own footprint • Ergonomic • Self-lifting; load stays low to the ground • Fine positioning	• Dependent on floor condition • Requires compressed air supply hose
Conveyors	Conveyors provide continuous movement between specific points over a fixed path.	• Relatively low-cost and efficient means of moving loads • Can move high volumes very quickly	• Only works along a set path, little flexibility • Expensive to install • Not self-loading
Fork and clamp trucks	Forklifts lift rolls on forks to move over variable paths.	• Flexible and user-friendly move system • Can provide limited vertical movement • Can move, turn, and even load rolls • Can work with very heavy rolls • Can work with multiple rolls simultaneously	• Requires plenty of open floor space • Requires trained, certified operator • Risks to human safety • Risk of damage to rolls • Requires regular maintenance • Can be expensive
Wheeled casters or dollies	Wheeled casters can carry loads, possibly including powered mechanisms to load/tug/push.	• Easy to use and operate • Low cost	• Significant weight limitations • High floor point loading • Wheels can damage floors (weight centered on specific points) • May pose some risk of damage to rolls • Powered units need maintenance/service • Difficult to finely position rolls
Overhead systems	Cranes lift from above and move loads over a set path, both horizontally and vertically.	• Works with loads of all shapes and sizes • Flexible configurations and uses possible • Can work with very heavy rolls	• Expensive to install and operate • Slow to operate • High risks to operators and rolls with suspended load • Limited area of operation • Operator training/certifications required

4 How air casters optimize roll handling

With air casters, a single operator can smoothly and precisely transport, rotate, and position heavy paper, plastic, or coil rolls.

1 Preparation

Preparation *may* be required before using air casters, depending on the needs and circumstances of the facility and operator.

First, ensure the floor surface is free of debris.

Second, it may be helpful (or necessary) in some cases to prep the facility itself to facilitate the use of air casters.

Third, the load itself may need to be prepped. In general, this won't be necessary.

2 Staging

When operators turn the air on, the air casters simply lift the load up, engaging the bottom edge of the roll. The specific air caster system used (see next section) will depend on how operators want to stage the roll, e.g., roll above a shallow pit, lift directly from the floor, or offload directly from processing equipment.

Many air caster-based roll handling systems include an aluminum interface shaped to match the diameter of the roll, so the transition is smooth and risk-free. At that point, the paper roll is floating at near zero friction, ready to glide.

3 Moving/Loading

One of the most delicate aspects of roll handling is loading the roll into paper processing or conveying equipment. At the rates these machines spin, even slight off-balances can cause production problems, so precise positioning is key. Generally, air casters accommodate this requirement. For example, the mandrels in the paper handling equipment will open, and the user can nudge the paper roll into the exact position before the mandrels close again. Thus, they can accommodate mandrels with little-to-no stress, and the operator stays in perfect control. Fine positioning of even multi-ton rolls requires only a small push or rotation.

Purpose-built roll handler positions the roll on a spindle

5 Specific roll handling designs

1 Air Pallets

Pallet with Roll Chocks

Pallet, Chocks, Handle, No-Load Wheels

Plank with Roll Chocks

Air pallets are low-profile systems used to move large and heavy paper rolls. They can accommodate a variety of diameters and widths, with a V-shaped chock to ensure roll control during transport.

The pallets are easy to use by a single operator with minimal training requirements. Some designs allow users to move by pushing on the roll; others incorporate a handle for more controlled steering without touching the product. In some isolated cases, some facilities may build a shallow pit where the paper roll will be loaded onto the air caster system; that enables users to just roll the paper along the floor until it's above the pallet, where the air casters can then be inflated to pick up the roll.

2 Rollmover™

Connect the air hose

Slide Rollmover™ under roll

Push to move

A Rollmover™ is a simple system where two small chocks independent of each other have air casters underneath them, connected by a single air hose. Thus, the Rollmover™ can accommodate almost any roll width. To operate, users slide the chocks in from each side on the floor around the roll and turn the air on, and then the roll is floating.

As a result, the Rollmover™ is self-loading when it picks the roll up off the floor. Operators put their hands on the paper roll to move the load. In general, the Rollmover™ is the least expensive, smallest, and least intrusive option.

3 Rollmaster™

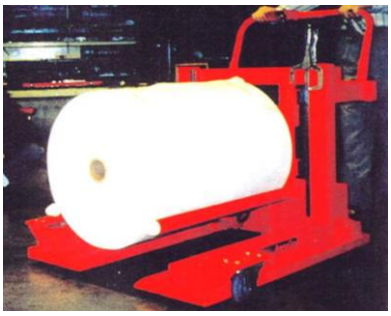
Slide the Rollmaster™ under the roll

Inflate the air casters

Push to move

The Rollmaster™ is suitable to assist installed equipment or replace traditional material handling equipment including hand trucks, pallet jacks, and forklifts. The Rollmaster™ comes in from one side of the roll and has a handle on it with a throttle that interfaces between the operator and the roll. As a result, the operator uses the handle to move the paper roll for more robust control and maneuverability. The Rollmaster™ is perfect in instances where the operator shouldn't touch the paper roll itself. Note that the Rollmaster™ can be customized for a variety of roll diameters. When not in use, "no-load" wheels allow for easy positioning when unloaded.

4 Custom systems



Air caster systems can also be purpose-built to meet the exact specifications of the factory. Engineered designs offer adjustability for a variety of roll types, widths, and weights. Roll carriers, for example, can be designed to accommodate unusual sizes or weights, or to interface with paper processing equipment in specific ways. Roll receivers can be designed to fit seamlessly into the production flow, moving rolls directly from one machine to the next.

For more information, please email us at **info@aerogo.com** or visit **https://www.aerogo.com/applications/roll-handling**. Thank you!

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AeroGo manufactures innovative load moving equipment, utilizing wheels and hovercraft technology, that move heavy, awkward, or delicate loads in factories.

Companies large and small find benefit from our worldwide dealer network, experienced product specialists, and skilled engineers. They will work with you to find a load moving solution that is safe, efficient and cost-effective, as your valuable loads are carried through the manufacturing process.

From our Standard Product offerings to our highly customized Engineered Systems, AeroGo has an innovative solution for your load moving need.

- ☑ Solutions Focused
- ☑ Team Approach
- ☑ Engineering Expertise
- ☑ Lean Manufacturing
- ☑ ISO Compliant