



Equipping Loading Docks for Swing Door Trailers

A look at the unique obstacles swing door trailers present at loading docks and the issues that arise from hinge gaps

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Introduction

Many factors contribute to how a facility chooses the type of dock seal or shelter for their loading areas, and while trailer size and truck type are some of the largest contributors to the decision-making process, another vital component of the vehicle is oftentimes overlooked: the door style. The two primary door styles available on semi-trailers are swing doors or roll-up doors, and each presents its users with different benefits and challenges.

Swing doors are designed to maximize cargo area and provide the largest possible opening into the trailer. Not only do they help increase the amount of freight a vehicle can transport, but they also make it easier for larger shipment items to move in or out of the trailer. However, they can be more tedious to operate, as they require the driver to open and close them away from the dock. Roll-up doors, however, remain closed until dock attendants are ready to begin loading or unloading and are closed once their tasks are complete. Even though roll-up styles are easier to operate, the door tracks take up valuable cargo space and provide less clearance than a swing-style door. Roll-up doors are also more costly to maintain because they have various parts that need to be adjusted and lubricated, while swing doors operate solely on hinges.

With their cost-effective design and unrestricted trailer access, swing doors are exceedingly popular in the material handling and trucking industries. However, the hinges on the doors produce gaps along the sides of the trailer and create vulnerabilities at the loading dock for energy loss and contaminant entry. Since they are used just as frequently as roll-up doors, it can be difficult for facilities to determine which style of door they need to prepare for at their loading dock.

In this white paper, we'll discuss the various challenges that hinge gaps present at loading areas and evaluate how dock seals and shelters perform with swing door trailers. Then, we'll take a look at a specialized solution that combines the flexibility of a dock seal with the robust size and performance of a shelter to maximize access into trailers while sealing all air and light gaps.

Hinge Gap Hazards

Although swing door trailers provide unobstructed access to the trailer, their use of hinges creates several issues for loading dock operations. Although necessary for the trailer doors to open and function properly, the hinges create gaps along the sides. While they may initially appear small and insignificant, those gaps average 1 to 2 inches wide, which equates to nearly a 3-square-foot hole at each dock opening for cold air, snow, rain, dust fumes, debris and other contaminants to enter the loading area. Not only do these gaps provide vulnerable points of entry into the facility, but they also allow valuable energy, heating and air conditioning to escape.

Hinge gaps allow a considerable amount of air infiltration to occur, which not only jeopardizes a facility's temperature, climate and environmental control but also can lead to slip hazards. When warm, humid air enters a warehouse in spring and summer, moisture droplets will form on the smooth concrete slabs of the loading dock floor. This phenomenon is called sweating slab syndrome (SSS) and it poses threats to employee safety, product integrity and facility profitability. Any amount of water at the dock creates slippery conditions that can lead to injuries or damaged products and equipment. This is because condensation on smooth surfaces, like indoor concrete slabs found at loading docks, acts as a highly effective lubricant. What makes matters worse is that this film of water is not immediately visible to pedestrians or forklift drivers.¹ With a slip hazard present at the dock, workers are more prone to injury and forklifts may skid across the warehouse floor, damaging products and equipment.

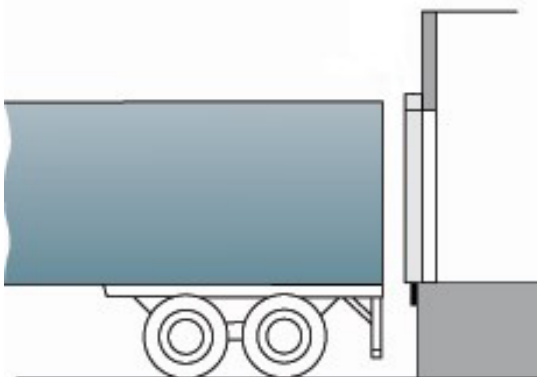
In addition to physical hazards, gaps also can negatively affect facility operations by raising energy costs. On average, warehouses spend \$0.75 per square foot on energy expenditures with 15% of the overall operating budget dedicated to energy spending.² Within that budget, it is estimated that supply chain and logistics operations represent 75% of a company's energy usage and environmental footprint.³ Several factors, including the number of times per hour dock doors must cycle and the variety of equipment that is required to load or unload each trailer, contribute to loading docks utilizing the majority of warehouse energy consumption. Aside from using electricity to engage and disengage dock doors and equipment, each time a dock is in use it also presents vulnerabilities where heating or air conditioning can escape, further increasing operational costs and energy spending.

In addition to raising overhead costs, hinge gaps are also large enough for bugs, dust, fumes and other contaminants to enter. Insects entering the dock can range from a nuisance to product contamination to a health and safety concern if an employee is stung by a bee or wasp. OSHA has 71 recorded cases of workers being killed or hospitalized from allergic reactions to bee and wasp stings, in addition to workers falling from ladders and elevated surfaces while trying to get away. On September 16, 2016, an employee in Illinois was stung while standing near a loading dock and suffered an

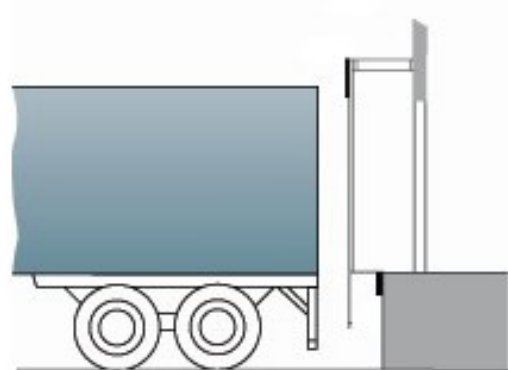
anaphylaxis reaction and died as a result.⁴ On August 11, 2017, an employee in Texas was working on a ladder in a commercial building when he was swarmed by bees and fell, fracturing his hip and requiring hospitalization.⁵ Closing gaps not only helps protect employees from insect entry, but it can also help prevent air infiltration, which allows mists, fumes, dry particles, natural and synthetic fibers and other atmospheric dust to enter a facility and contaminate products.⁶ Preventing air infiltration to preserve product integrity is especially important in food-grade or pharmaceutical facilities, where the need to meet sanitation standards is critical for operations and the loading area plays an integral role in helping ensure facilities can meet FDA and USDA inspections and requirements.

Performance of Dock Seals and Shelters

Dock seals and shelters provide substantial environmental protection and can help eliminate moisture, reduce energy costs, improve temperature control and block airborne contaminants and pests from entering the dock area. However, there are several factors facilities must consider when choosing the proper seal or shelter for each application. In this section, we'll take a brief look at how dock seals and shelters differ in terms of design and performance, and what option is best for use with swing door trailers.



Compression Foam Dock Seal



Dock Shelter with Side Curtains

Dock seals are made of high-density polyurethane foam with heavy-duty cover material and compress against the back of trailers to seal the loading dock. These generally offer a tighter seal than a traditional truck shelter, but they are not well suited for every application and cannot be used on doors wider than 10 feet. Dock seals also can only be installed on walls designed to handle the 80 pounds of compression force per square foot of pad length. If doors are wider than 10 feet or minimizing pressure on the dock wall is a concern, truck shelters are a better choice. Truck shelters traditionally have a

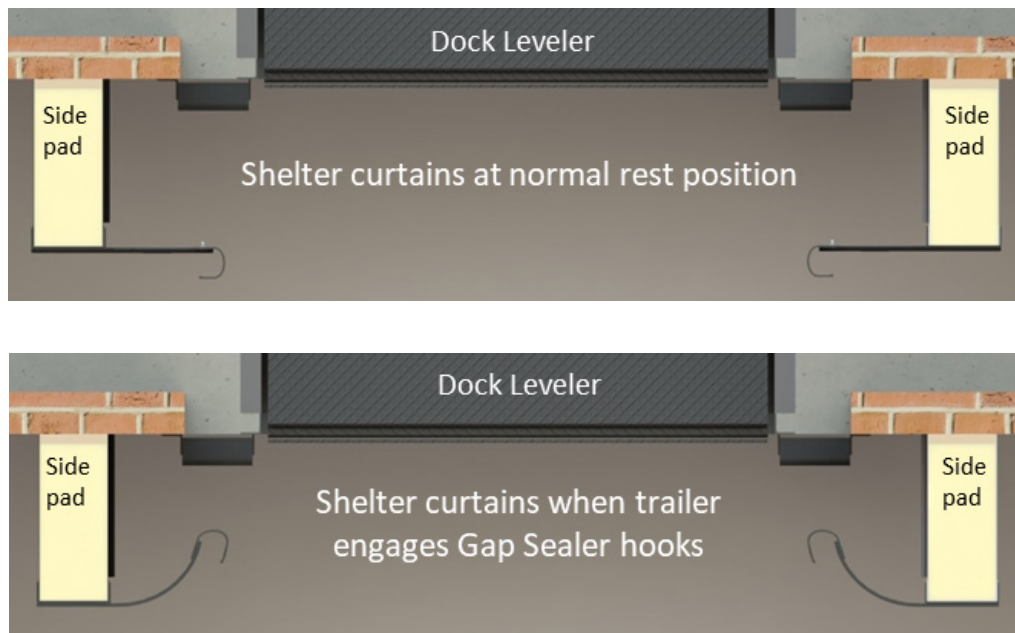
rigid frame made out of wood, but there are soft-sided shelters that utilize foam and are more flexible to prevent damage from impacts and offer a greater resilience against trucks that approach the dock off-center. Unlike compression seals that make contact with the back of the trailer, the curtains on dock shelters seal against the sides.

Oftentimes, facilities must decide what is more important for their operations when utilizing swing door trailers: obtaining unobstructed access to the trailer or sealing the hinge gaps. While dock seals usually provide better temperature control and lower energy costs, they do have limitations. Although the hinge gaps are mostly sealed when the trailer backs into the dock, the compression foam padding can impede the full-width access to the trailer and interfere with, or in some cases, block pallets at the very back of the trailer on wider loads.³ If the compressed dock seal spills into the trailer opening, it can not only hinder and stall dock operations if the opening becomes too narrow for the freight, but the dock seal can also be at risk from damage and get torn or ripped by passing forklifts or pallets.

By sealing against the sides of the trailers, truck shelters still allow full-width access to the trailer and do not impede the loading dock door lane. Truck shelters are ideal for facilities that need to minimize pressure on building walls with loading dock doors up to 12 feet wide and can accommodate a wider variety of vehicles and trailer configurations but do not create a perfect seal with swing door trailers. The curtains seal against the sides of the trailer but fail to seal the openings along the hinges.

Full Trailer Access and Gap Protection

Shelter systems with hinge guards provide full access to the trailer bed while also sealing all air and light gaps at the hinges. The hinge guard works as soon as the trailer reverses into the dock and grasps the sides of the trailer to block gaps. Truck shelters with hinge guards provide a consistent seal to maximize environmental protection and energy savings while offering full and unrestricted access to the trailer.³ However, shelters are traditionally hard-sided and due to their lack of flexibility, they are prone to damage if a truck approaches the dock off-center.



A tight approach or limited apron space can make it difficult even for experienced truck drivers to back in and align correctly with the dock. Off-center impacts from trailers cause a tremendous amount of damage to the building and can ruin the truck shelter, causing not only expensive repairs but also prolonged downtime at the dock and an overall decrease in facility profitability. The risk of expensive repairs and downtime can make some facilities hesitant about installing truck shelters, but with the right design, shelters can be just as pliable as a compression foam dock seal.

The GS Series Dock Shelter from NOVA Technology was developed to meet the industry's needs for a soft-sided truck shelter that could withstand impacts, allow full access to trailer beds and provide gap protection for swing doors. Unlike shelters with wooden side frames, the GS Series utilizes flexible, high-density polyurethane foam for greater damage resistance and features a hook-style rubber trim to seal hinges. The side pads allow the unit to bend out of the way if struck by a backing vehicle, protecting the building and unit and eliminating costly repairs.



GS Series Dock Shelter from NOVA Technology

Along with exceptional performance and damage resistance, the GS Series also provides superior environmental protection and temperature control. Side curtains feature fiberglass stays for added rigidity and an EPDM rubber trim that effectively blocks air and light gaps around trailer door hinges while offering enhanced wear and weather resistance. As swing door trailers back into the dock, the curved rubber trim clasps the sides of the doors and encloses the hinge gaps. Running the length of the side curtain, the rubber seals the hinge gaps and prevents air or moisture infiltration and eliminates entry points for insects, dust, debris or fumes to enter the building. To protect against openings that may be present between the trailer, bumpers and leveler, draft pads are included at the base of the curtains.

The GS Series Dock Shelter is designed for versatility, capable of sealing most vehicles with swing or roll-up doors and sized to fit door openings up to 12 feet wide and 12 feet high. Along with impact-resistant side pads, the GS Series further lowers ownership costs by utilizing Velcro® attachments on the side curtains and draft pads for easy reattachment if either are struck and removed by a trailer. Low-maintenance and built to last, the GS Series also features reinforced wear pleats, durable cover material and a raked header for water drainage and snow load support.



GS Series Dock Shelter allows full-width access to the trailer and seals the hinge gaps

Key Takeaways

Loading dock sealing systems are just as critical to material handling operations as dock levelers, vehicle restraints, overhead doors, forklifts and other essential equipment. A poorly-fitting dock seal or shelter allows a considerable amount of air, moisture, insect and contaminant infiltration that can risk product integrity and employee safety. While most seals and shelters can easily accommodate trailers with roll-up doors, swing door trailers can be more challenging due to the gaps created along the sides of the trailer at their hinges.

In this white paper, you learned:

- Why swing doors can be preferred over roll-up trailer doors
- Risks and hazards associated with hinge gaps
- How seals and shelters perform with swing-open trailers
- The design needed to seal hinge gaps without hindering trailer access
- How the GS Shelter from NOVA Technology outperforms traditional truck shelters by sealing hinge gaps and preventing damage with impact-resistant foam side pads

There are many aspects to consider when choosing the right dock product for swing door trailers, but the best option will allow full-width access to the trailer for easier cargo movement and eliminate hinge gaps to reduce hazards or prevent contaminant entry. A truck shelter with a hook-style rubber hinge guard like the GS Series provides enhanced environmental and temperature control by sealing the hinge gaps that traditional truck shelters otherwise leave unprotected. By blocking air and light gaps with a dock shelter like the GS Series, facilities can achieve a positive seal around swing door trailers while retaining unobstructed access into the trailer bed for more efficient and cost-effective material handling operations.

About NOVA Technology

NOVA Technology is an international manufacturer and distributor of loading dock equipment and accessories. For over 30 years, NOVA has provided the innovation, reliability and resources needed for our customers to handle the continuously evolving needs of the material handling industry. We offer a variety of dock levelers, seals and shelters, vehicle restraints, light communication systems, dock lifts, safety barrier products and a selection of aftermarket parts and accessories. All of our products are designed to maximize safety, productivity, security and environmental control at loading docks and throughout commercial facilities. Call us today at 1-800-236-7325 or send an email to sales@novalocks.com for more information or to find a dealer in your area.

¹ Carlson, B. (2018, August 21). *The Effects of Sweating Slab Syndrome*. ARCHR News. <https://www.achrnews.com/blogs/16-guest-blog/post/139604-the-effects-of-sweating-slab-syndrome>

² Alexander, M. (2019, June 5). *5 Ways to Reduce Energy Costs for Your Industrial Space*. LoopNet. <https://www.loopnet.com/learn/5-ways-to-reduce-energy-costs-for-your-industrial-space/1860588887/>

³ Brittingham, M. (2014, October 24). *Steps to Achieving an Efficient and Temperature Controlled Loading Dock*. Manufacturing.Net. <https://www.manufacturing.net/home/article/13184187/steps-to-achieving-an-efficient-and-temperature-controlled-loading-dock>

⁴ Occupational Safety and Health Administration. (2016, September 16). *Incident Report – 88877.015*. US Department of Labor. https://www.osha.gov/pls/imis/accidentsearch.accident_detail?id=88877.015

⁵ Occupational Safety and Health Administration. (2017, August 11). *Incident Report – 99264.015*. US Department of Labor. https://www.osha.gov/pls/imis/accidentsearch.accident_detail?id=99264.015

⁶ Brittingham, M. (2010, December 1). *The Bug Stops Here: Plugging the Points of Entry Against Infiltrating Contaminants Helps Food Facilities Ensure a Safer Product*. Occupational Health and Safety. <https://ohsonline.com/Articles/2010/12/01/The-Bug-Stops-Here.aspx>