Advantages of Sealed Loading Dock Doors

For years there have been two issues with loading docks—stopping energy loss and dock accident protection. With rising concerns about product quality, processing plant management has a new question to ask—how well does the dock protect against the invasion of airborne contaminants?

According to Bruce Paulson with Evapco, Inc. in a paper entitled Pressurization of Critical Process Areas, "the food industry is now coming to realize that the air in and around a critical process area, which comes into direct or indirect contact with the food product, is a possible vehicle for the spread of pathogenic organisms."

Since the realization in the 1970's that energy is no longer going to be as cheap as it was, facility owners of all kinds have been on a mission to seal up the building envelope in order to retain as much of that energy as possible. For structures that use them, the loading dock should be a prime target, and this is especially true for keeping contaminants out of a building.

Leaky docks, whether due to outside air infiltration or inside air escaping, can be a major issue for product quality control, especially on cold storage docks. If the cooling system has difficulty holding temperature, any slight product thawing can lead to a reduction in product safety. As Rich Bartel, plant manager with Koch Foods in Franklin Park, IL puts it regarding the poultry his company handles, "To have dock doors weeping warm air or the dock area dripping with condensation implies that we have a dirty environment." This is a sign of possible contamination problems.

The air that can seep into a building is more than oxygen, nitrogen and CO2. It includes dust; which is a mixture of smoke, mist, fumes, dry particles and fibers. This is just the inert material. The worst case invaders include molds, bacteria, pollens, yeasts and viruses so small they are invisible to the naked eye yet carrying very real threats for food products.

These pathogenic microorganisms cannot grow while airborne, but when they land on food products, these nutrients cause the invaders to multiply. The infiltration—the exchange of air between the indoors and the outdoors—that occurs should be a major concern for a food processing plant. For this exchange to occur there have to be cracks in the building envelope and differential pressures to draw in the contaminants. Particles smaller than ten microns can be easily transported in the air, and those include any kind of bacteria and virus as well as most sizes of fungus, molds and yeasts.

The prime point of entry for these contaminants is at the dock door, on average an 8' × 10' opening that provides a giant corridor for these particles to enter the building. From there, they can make their way into adjacent process areas and onto exposed food products.

On a typical dock, closing the door is seen as all that needs to be done to protect food quality, but all aspects of the dock – the five doorway dimensions – have to be evaluated to ensure the dock is sealed and safe.

Dimensions I & II: Side of the doorway

To truly have a sealed dock doorway the best choice is a fully impactable dock door. With standard overhead and sectional dock doors, quite often being closed does not necessarily mean the doorway is sealed.

Dock doors are continually subjected to forklift collisions, especially on tight, busy docks. In today's processing environment, that is practically everywhere. Each time a door gets hit the dock seal ultimately suffers the penalty, no matter how hard the impact.

Since standard dock doors are similar in design to the garage door at home, when the door is impacted the bendable roller guides within the flimsy sheet metal tracks can make the door difficult to operate, even if the door suffers a minor hit. The tougher the door is to open, the more the dock crew will be tempted to leave the door open between truck loads, which greatly increases the risk of contaminant infiltration and/or energy loss.

The impacts can also lead to misalignment between the door panels and doorframe. As covered previously, any gap can be an entryway for contamination.

Impactable dock doors are made to withstand forklift pounding. When hit, the panels do not resist the impact, rather the guidance system allows the panel to release and can then quickly be reset into place to keep the door closed. These doors combine the use of rolling retractable plungers instead of metal rollers and a

high impact molded plastic track or 12-gauge galvanized steel track instead of thin gauge metal to provide the durable "impactability" that prevents door and panel damage to provide a consistent doorway seal.

Dimension III: Bottom of the doorway

Standard pit-mounted dock levelers are excellent at providing safe trailer access for forklifts, but they can present a challenge in sealing the dock because of the concrete pit cut into the dock floor.

Because they are installed in a concrete pit, gaps are formed between the leveler deck and the warehouse floor. These gaps can allow outside air and contaminant infiltration as well as allow energy loss. To combat this, kits are available that provide a tight perimeter seal on the sides and rear angle of the leveler to eliminate the mass air flow in and out of the building which not only addresses the contaminant concern but also improves energy efficiency without impeding the working range or operation of the leveler.

An alternative to pit style dock levelers, modular dock bridges and vertical storing powered levelers store upright when not in use, allowing the dock door to close tightly against the concrete floor to seal in the energy and lock out the elements. Vertical levelers can provide the same operational efficiency of powered pit levelers, but provide the added benefit of a full perimeter seal. Both modular dock bridges and vertical levelers also act as a steel barrier when stored to protect overhead doors from forklift assaults.

Dimension IV: Top of the doorway

Moisture can be another source of contamination as well as being a safety hazard leading to slippery floors. Dock seals and shelters can be combined with rain-sealing systems to literally wipe off moisture from the roof of backing trailers to keep it out of the dock area. These rain sealing systems attached to the top or header of the dock seal/shelter and are fitted with an ingenious wiper pad that sweeps rain, snow and condensation off the roof of the trailer.

Dimension V: Between the doorway & the truck

One of the biggest challenges for sealing a building occurs during loading and unloading operations.

Dock seals and shelters keep out contaminants by enveloping the top and sides of the truck trailer, creating an energy barrier. However, seals and shelters also bear the full brunt of the trailer backing into them, so rugged construction along with routine inspection is critical to ensuring they are in shape to cut energy loss. Some models offer replaceable Velcro sections if excessive wear occurs.

Vehicle restraints are primarily use to provide safety for forklift drivers by preventing premature trailer departure from the dock; however, they are also part of the package in sealing off the doorway. Because they restrict the horizontal

movement of the trailer they allow the dock seal to work most effectively to ensure a tight dock seal. Many facilities still use rubber wheel chocks to hold a parked truck in place. Even if the driver parks firmly against the wall the force of the forklift driving in and out of the trailer can defeat manual chocks and cause it to creep away from the dock, thus undermining the effectiveness of the dock seal/shelter to keep the elements out.

However the challenge doesn't end with selecting the proper dock leveler, impactable door, vehicle restraint or dock seal. Efficient operational sequence of that equipment must be maintained in order to optimize the perimeter seal. Master control panels allow integration of all dock equipment controls into one centralized control box, interlocked into predetermined sequence. For example, the vehicle restraint will not disengage and the truck cannot pull away from the dock until the door is completely closed, ensuring no unnecessary exposure of the dock and enhancing security between truckloads.

These controls also utilize LED lights to provide the internal and external communication that is important to proper equipment engagement. In addition, LED's provide significant operational and energy advantages over incandescent bulbs.

Food processors are fighting a constant air war against pathogens that can come into direct or indirect contact with food products, resulting in product returns, a destroyed reputation in the market and increased regulatory surveillance.

Including the loading dock as part of the product quality plan and utilizing equipment and controls that maintain a full perimeter seal can not only save an operation thousands of dollars a year in lost energy, but also provide a more closed circuit means of handling food during processing to prevent contaminant infiltration and provide greater product safety.

For more information, visit www.4frontes.com [1].

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