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Product Group /

Elevating Equipment

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Ways to save energy in a Vehicle Loading Dock Area

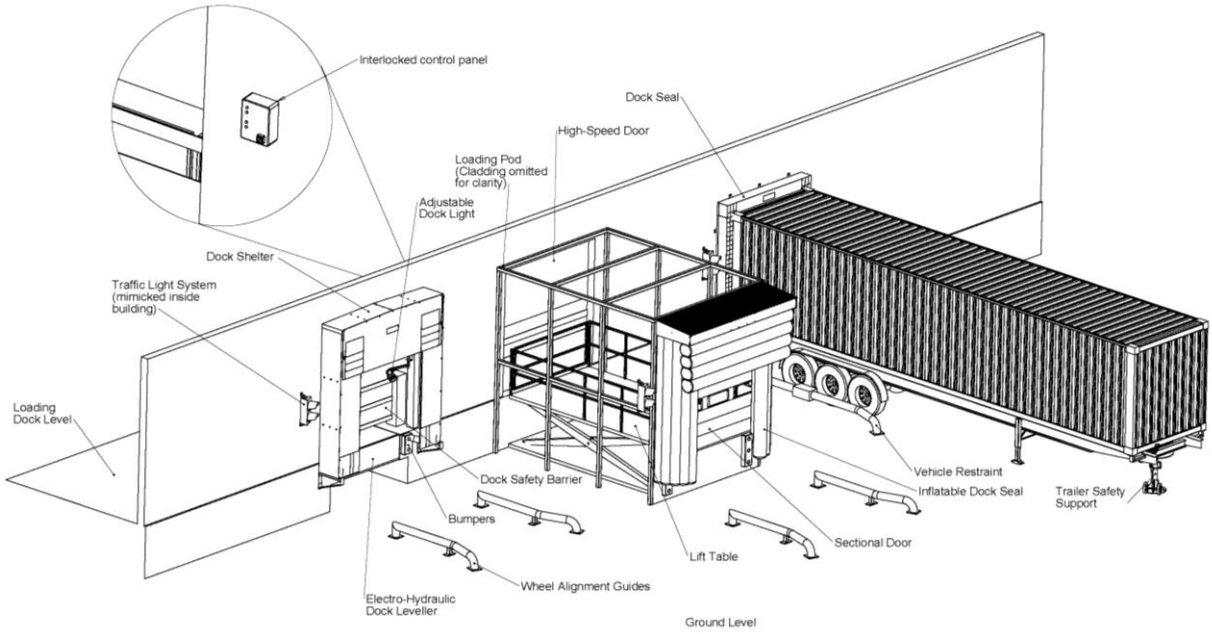
INDEX

1. What Is A Loading / Unloading Dock?

A loading/unloading area is an area within a building or facility where vehicles are loaded and unloaded, where a height differential exists.

The greatest potential for energy loss in a loading/unloading area is in temperature controlled environments, where a temperature difference exists between the building and the outside environment. For this reason, this document will focus on energy saving techniques in such applications.

The vehicles are normally loaded/unloaded with either; a dock leveller, scissor lift or bridging plate. There is a height differential between outside yard height, and the inside building floor level. The loading/unloading application takes place on/around the envelope of the building.



2. Intention of This Guideline

To provide users, designers and suppliers with an awareness of a selection of recognised solutions used to reduce energy loss / consumption in the loading/ unloading area.

This document is not exhaustive; new products may be released to provide alternative solutions at any time.

Note that this document does not include specific details relating to the operation/maintenance of equipment. All solutions proposed must be operated and maintained in accordance with suppliers' recommendations to remain effective.

3. Key Areas

Listed generally in decreasing order of effectiveness.

1.1. Prevent bad habits

Bad habits, or malicious misuse of equipment can significantly reduce the equipment's potential to save energy.

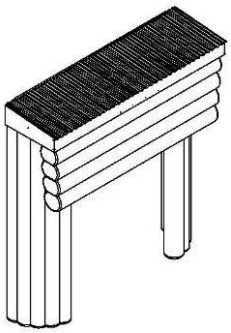
1.2. Maintenance

Ensuring that any systems in place remain fit for purpose is critical in ensuring they achieve the maximum energy savings.

1.3. Choose an effective seal:

A seal is used to prevent/reduce energy transfer from inside the building to the outside environment. They type of seal chosen determines the potential energy savings.

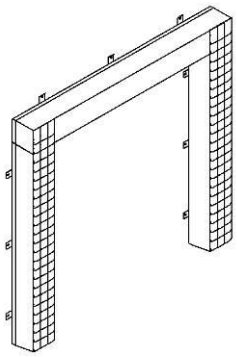
1.3.1. Inflatable Dock Seal



Air is blown into airbags which wrap around the vehicle (typically top and sides), and apply a pressure against the vehicle in order to make the seal.
This type of seal typically allows for variations in vehicle size.
Depending on loading dock configuration, it is possible to dock the vehicle and inflate the seal prior to opening the vehicle doors.
In the case of vehicles fitted with barn type doors; if the doors are opened prior to docking, the seal will be created against the opened door, rather than the side of the vehicle, potentially leaving a gap between vehicle door and body.
A constant air supply is required in order to maintain the seal (typically from an electrical fan), though energy consumption is significantly lower than the potential energy loss improvements offered.

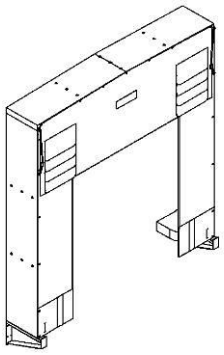
Inflatable Dock Seals typically seal top and sides, though further improvements can be made with the incorporation of a bottom seal if possible.

Foam Pad Seal



Provide a better temperature control than a Dock Shelter, but the nature of the design means they will only work with similar sized vehicles. Ideally suited to companies operating fleets of similar vehicles.
Typically a foam core, with neoprene/PVC cover and optional wear pleats.
The vehicle reverses back against the pads; the pads deforming around the back of the vehicle creating a seal. In the case of vehicles fitted with barn type doors, the doors must be opened prior to docking.
Typically 3 sided (top and both sides), but further sealing can be offered with a 4 sided design, incorporating a bottom seal (depending on the dock leveller/bridging plate/scissor lift table configuration).

1.3.2. Dock Shelter



Reduces the effects of wind and weather, more suited to ambient temperate operations.
Typically a single skin design; the vehicle reverses up to / between the curtains which apply a pressure back against the vehicle to create a limited seal.
Improved sealing when used with (typically optional) corner sealing pads.

1.3.3. Sealing between door and side of vehicle when doors are opened. (Applicable to Dock Shelters and Inflatable Dock Seals)

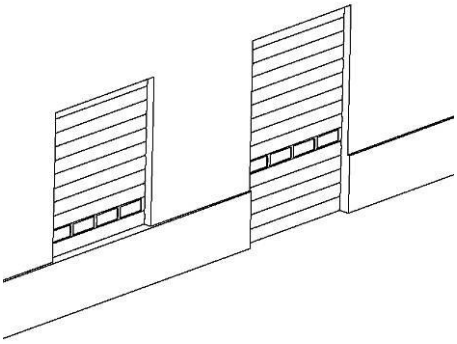
A typical operation opens the vehicle doors prior to reversing against a loading dock, swinging them out and back against the outside of the vehicle body. The Dock Shelter / Inflatable Seal makes a seal against this door, but typically a gap exists between the door and vehicle body, leaving potential for unwanted energy transfer.

How to close the building

1.3.4. Door

Type:

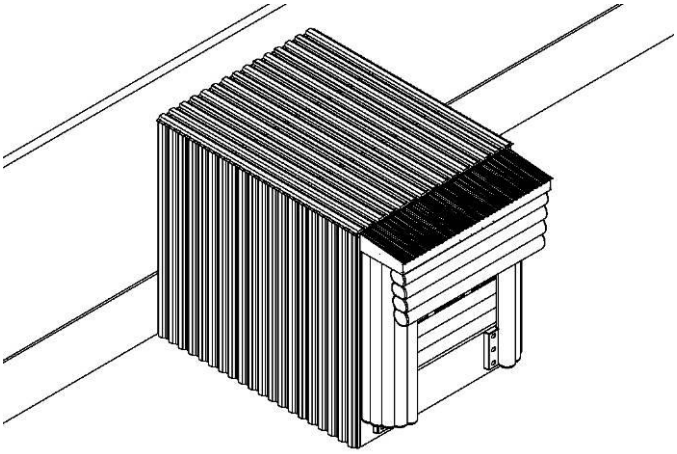
- Speed
- Insulation
- Reduce the time that doors are opened, thus reduce the energy loss potential.



1.3.5. Installation – close door in front of Dock Leveller / Lift Table (envelope of building)

As above, a Dock Leveller or Lift Table can often form part of the envelope of the building. Insulation and/or air seals will reduce heat transfer in this area, but consider alternative loading dock configurations, where the door closes in front of the dock leveller/lift table, further reducing heat transfer when closed/parked.

1.3.6. Dock House / Pod



Insulated. Use of fast acting doors

Dock Design / Operational sequence (interlocked)

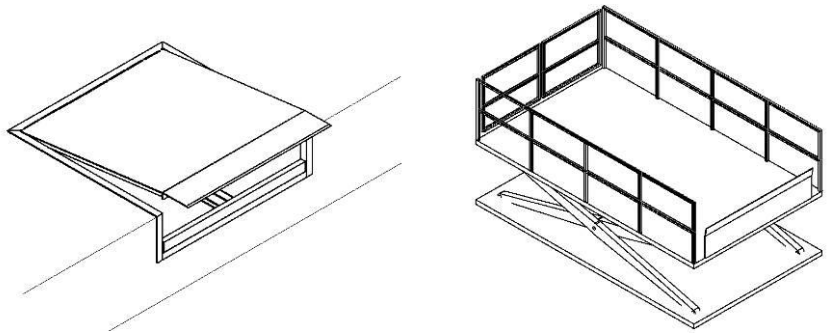
The design of a loading dock, and the interlocking of loading dock equipment adds a further element of efficiency by ensuring equipment can only be operated in a certain sequence. This reduces the chance of human error leading to unnecessary energy loss.

Interlocking can be between only a small number of pieces of equipment, up to a totally integrated system where every step of the process is interlocked to the next.

Methods of dock design, operation sequence and interlocking can include:

- Dock design to allow vehicle doors to be opened after docking.
- Loading Dock door to be opened once the vehicle is docked.
- Wheel lock will not release until the Loading Dock door is closed to prevent premature driveaways.
- Locks and/or communication with vehicle drivers to prevent premature driveaways.

1.4. Insulated / Sealed Dock Leveller / Lift Table



Depending on the configuration of the loading dock, Dock Levellers or Lift Tables can form part of the envelope of the building. Many suppliers offer insulated decking and/or air seals to reduce heat transfer.

1.5. Consider energy consumption when purchasing equipment

A dock leveller is only raised and parked once during a loading/unloading operation, so energy consumption is relatively minimal, however consider energy consumption of lift tables which typically perform numerous lifts during a loading/unloading operation.

Select appropriate materials handling equipment – using a high capacity fork lift truck will consume more energy than a smaller pallet truck, which may be more suited to the application.

4. References

1. McVittie, G & Gillies, A, (2017). *Factors Affecting Air Ingress Rates To A Modern Low Temperature Facility And Methods To Reduce The Effects*

The recommendations and advice contained in this Guidance Note are based on specifications, procedures and other information that have been collected from the FEM from its members. They represent what is, as far as FEM is aware, the best available data at the time of publication on the instruction and use of the equipment concerned in the general conditions described and are intended to provide guidance for such use.

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