



DASMA
Door & Access Systems
Manufacturers Association
International

COMMERCIAL & RESIDENTIAL GARAGE DOOR DIVISION

TECHNICAL DATA SHEET

#182

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Technical Considerations for Dock Doors

Introduction

The intent of this Technical Data Sheet is for building owners, facility managers and design professionals to better understand the loading dock environment with respect to technical considerations for dock doors associated with vehicular access. This document will describe the different types of dock doors, along with other dock related items that interface and affect door operation.

Definitions

The following definitions are based on information found in ANSI/LODEM MH30.3, Vehicle Restraining Devices: Safety, Performance and Testing.

- Dock Door: A door serving a loading dock. The door allows access to a transport vehicle for loading and unloading operations.
- Loading Dock: A building area or structure where goods are moved to and from a transport vehicle. The dock is usually elevated above a driveway where the transport vehicle is parked.
- Dock Leveler: A device affixed to a dock structure to form a bridge between the dock structure and a transport vehicle, thus allowing movement of industrial vehicles between the transport vehicle and the dock structure.
- Transport Vehicle: A cargo-carrying vehicle (e.g., a truck, semi-trailer, or trailer) which may be entered upon by a powered or non-powered industrial vehicle or conveyors to load or unload material.

Loading Dock Environment

The following items have an influence on a dock door.

- Installation and Maintenance: Properly installed and maintained doors not only allow the doors to operate as designed, but to also allow effective access to trucks at the dock position.
- Dock Leveler: A dock leveler must be installed and used per the manufacturer's instructions. The dock door may require a locking mechanism when in the closed position to ensure a continuous bottom seal.

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This Technical Data Sheet was prepared by the members of DASMA's Commercial & Residential Garage Door Division Technical Committee. DASMA is a trade association comprising manufacturers of rolling doors, fire doors, grilles, counter shutters, sheet doors, and related products; upward-acting residential and commercial garage doors; operating devices for garage doors and gates, sensing devices, and electronic remote controls for garage doors and gate operators; as well as companies that manufacture or supply either raw materials or significant components used in the manufacture and installation of the Active Members' products.

- **Shelter/Seals:** These products help the dock door control air infiltration and weather elements when a transport vehicle is at the dock position.
- **Dock Bumpers:** This product helps space a truck's position relative to the building and dock positions.
- **Bollards:** This product is often tailored for specific dock door openings. Placement should not interfere with door operation. In particular, placement should consider door components such as locks and reinforcements for high wind load.
- **Dock Lighting:** Should be located far enough from a dock door to keep door materials from the potential of igniting.
- **Dock Worker/Truck Driver Communication System:** The use of vehicle restraint devices is encouraged. Many vehicle restraint systems incorporate a communication light system as contained in ANSI/LODEM MH 30.3.
- **Dock Door Operators:** Operators should be properly adjusted for limits relative to floor and header, with opening and closing speeds to match environment requirements.
- All applicable building code requirements should be followed.
- **Building Floor Height versus Transport Vehicle Floor Height:** This influences the devices needed to bridge the gap between the floor height at the dock door with the potential range of transport vehicle floor heights.
- **Security:** Security doors are increasingly found in these applications. Space to install track and backhang supports may be affected by security related devices and equipment. Federal regulations may influence dock door installations, and should be consulted if applicable.

Common Dock Door Types and Features

Dock doors can be sectional doors, high performance doors, rolling doors, or sheet doors. The choice is dependent on the specific requirements of the loading dock application including head room considerations, building thermal performance including U-factor and air infiltration, door operation (motor operation vs. manual operation), and amount of expected usage. Sectional or rolling doors can be specified as insulated if separation of environments is a concern. Optional features include knockout/breakaway design doors and/or impact resistant guides to allow for equipment impact; vision lights; accessibility related hardware; and safety devices and mechanisms if motor operated doors are specified. A heavy use dock door can have an hourly, round-the-clock open/close duty cycle. Mounting clips, weather seals, and jamb brackets should be designed for either easy replacement or for impact resistance since they are subject to impacts from vehicles such as forklifts frequently passing through door openings. Door counterbalancing should keep the door from drifting into the opening where it can be impacted by vehicles.

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Dock Doors and Door Area

Door interlocks are sometimes put in place to help protect the dockworker from injury. Door controls may be interfaced with powered restraints to ensure vehicle position prior to opening the dock door. A loading dock floor is typically 48" above grade to allow minimal elevation change from the truck body and warehouse floor. Thus, the door should not be opened unless a transport vehicle is parked at the dock to fill the opening and/or a barrier is present to prevent a fall off the dock opening.

Building Considerations

- **Door Openings:** Dock door openings typically range from 8'x8' to 10'x10'. Door sizes should be optimized based on the largest truck body size that will use the opening. For example, if the largest truck body size anticipated is 8'-6" by 9'-4" inside dimensions, then a 12'x12' door would be oversized and would underutilize warehouse space.
- **Jamb and Header Mounting Materials:** Jamb and header mounting materials can include concrete block, tilt-up concrete panels, or metal framing. The door opening perimeter should be of a sufficient structural nature to support the door assembly.
- **Door Area Use:** From a safety point of view, use of the area around the door should be known. Items such as vertical leveler pits, bollard placement, safety barriers, and auxiliary equipment controls should be located to maximize safe dock operation. It is recommended that adjoining warehouse space be maximized by going to vertical lift or high lift track depending on the specific building/door geometry. A rolling door may also be used in cases of limited overhead space or depth into the room.
- **Door Vicinity Equipment/Piping:** Equipment and piping need to be taken into consideration in the vicinity of the door, commonly in the form of electricity, HVAC, water lines, and fire suppression systems. Making sure these items are located outside the door operating zone can save on unnecessary construction time and expense. Refer to TDS-276 for guidelines on rolling doors.

Thermal Performance Factor

If thermal performance is required, a number of factors need to be considered. Factors involving the dock door design include panel material and thickness, door-to-jamb seal, and section interface. Factors involving dock door use include dock leveler gaps, keeping debris clear of the door, and door maintenance. Door assembly U-factor should be determined using either ANSI/DASMA 105 or NFRC 100/NFRC 102, and door section R-value should be determined using TDS-163.

When the door is raised and not part of the truck-to-building seal, dock shelters and seals may reduce loss of conditioned air and prevent rain or snow from entering the platform surface.

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Wind Load

Dock doors may be installed in environments where high wind events are common. In all cases where a local code has been adopted and is being enforced, the local authority having jurisdiction is the determiner of door performance requirements. Wind load performance should be determined in accordance with ANSI/DASMA 108.

Choosing the Proper Dock Door

Factors that influence the choice of a dock door include building use, building configuration, security, products transported through the door opening, and types of transport vehicles utilizing the dock area.

Maintenance

The door manufacturer's installation instructions and maintenance guidelines should always be observed. The door manufacturer or a trained door systems technician should be contacted if there is any concern as to a door's performance or condition involving the door.

Conclusion

A dock door should be treated as an integral part of the loading dock system, alongside levelers, seal/shelters, lights, fans and communication systems where all such components must work together to maximize efficiency.

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