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Rolling Door Operation Under Wind Load Conditions

Introduction

This document provides information regarding the operation of a rolling door when subjected to wind loads acting to push the door inward (positive load) or pull the door outward (negative load.) This information can help door dealers and owners understand the effects of wind on door operation, and to dialogue intelligently with rolling door manufacturers regarding the matter.

General

Under either no wind or minimal wind conditions, door assemblies perform with minimal contact between the curtain and the guides as illustrated in Figures 1 and 3. But when subjected to high winds, the curtain will deflect and press against the guide angles as illustrated in Figures 2 and 4 – thus creating concern about door operation during such conditions. The resulting friction may or may not hinder the door operation enough to prevent normal vertical movement. Whether the door may still be operated at a given wind speed depends on many factors, especially door width and slat design (material type, gauge, and shape). The maximum wind load at which a particular door is still able to operate is called the *operational wind load* of the door.

Consult rolling door manufacturers for information on how wind affects the operation of particular products.

Operational Wind Load vs. Design Wind Load

It is important to distinguish *operational wind load*, as defined above, from *design wind load*. In accordance with ASCE 7, the recognized standard for determining loads on buildings, design wind load is the wind pressure a fully closed door is designed to withstand while remaining intact and safely operable *after* the wind ceases. When the wind force exceeds the design load for the door, the door can be blown out of the guides by being pushed into the building (under positive wind load) or sucked out of the opening (under negative wind load.) The design wind load is usually much higher than the operational wind load.

Note: Technical Data Sheets are information tools only and should not be used as substitutes for instructions from individual manufacturers. Always consult with individual manufacturers for specific recommendations for their products and check the applicable local regulations.

This Technical Data Sheet was prepared by the members of DASMA's Rolling 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.

Door With Curtain Mounted Windlocks

Some doors require curtain-mounted windlocks to withstand the specified design wind load. When these doors are subjected to high winds, the windlocks engage the guide-mounted windbars (see Figure 4), resulting in extreme friction that usually prevents vertical movement and may cause the door components to wear faster. If continued effort to open or close the door is exerted, damage to the curtain or other component parts may result.

Electrically Operated Door Subjected to Wind Load

An electrically operated door subjected to wind load may need to have the door controls wired for constant contact for both opening and closing the door. This means that the door will move while the open or close button is depressed and the door will stop when the button is released. If the controls are wired for momentary contact on open and close buttons, damage to the door may occur when the windlocks engage during opening or closing operation.

Curtain Deflection

Figures 1 through 4 show views of the jambs, guides and curtain for interior-mounted doors with no wind load and with wind load. The deflection of the curtain under load can exert a considerable force on objects in the horizontal path of the curtain as it deflects. The potential inward or outward movement of the curtain under wind load can be very significant, and should be marked on the floor as a precaution to prevent damage to objects adjacent to the curtain. The door manufacturer can provide an estimate of the maximum deflection of the curtain under wind load.

Specific Applications

The door manufacturer should be contacted if a door will be operated under windy conditions, or if a door is installed on a building with controlled internal pressure.

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ROLLING DOOR DIVISION
TECHNICAL DATA SHEET
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Figure 1
No Wind Load
No Windlocks

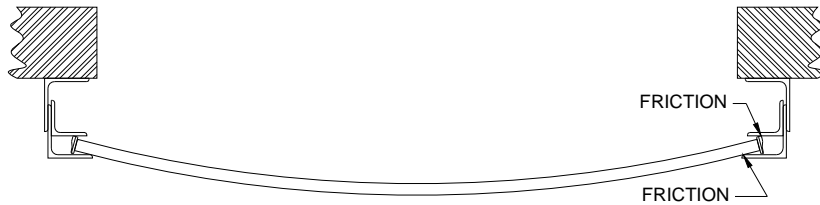


Figure 2
Wind Load
No Windlocks



Figure 3
No Wind Load
With Windlocks

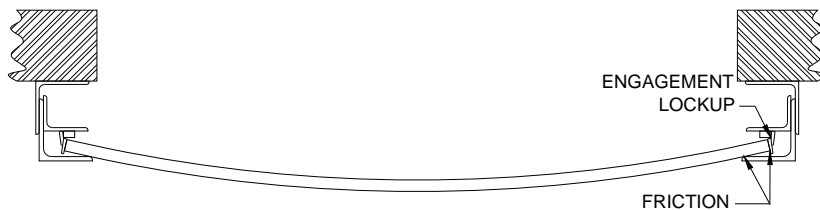


Figure 4
Wind Load
With Windlocks

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