

Automatic Doors and Manual Door Opening Force

In many situations, doors are subject to atmospheric conditions that affect manual operation. This document provides guidance on how automatic doors may be an effective way to address these conditions while providing ease of operation for door users.

Doors are affected by the following conditions, which lead to difficulty in using a manual door, particularly for individuals who may be young, infirm, elderly, disabled, or burdened with packages and other items:

- Natural wind
- Pressure variations between different areas of a building interior
- Variation in pressure between a building interior and exterior
- Poorly operating or improperly adjusted hardware

The pressure differences, often referred to as "stack pressures" or the "stack effect", are made more severe with temperature difference (cold interior, warm exterior, or vice versa) and with increases in building height, though any building height can result in stack pressure that makes manual door operation difficult.

The ICC/ANSI A117.1 standard, *Accessible and Usable Buildings and Facilities*, a standard referenced in the International Building Code and thus a "codified" standard, mandates the following maximum forces for pushing or pulling open doors other than fire doors (reference: Section 404.2.8):

1. Interior hinged door: 5.0 pounds
2. Sliding or folding door*: 5.0 pounds

*Note the requirement for sliding or folding doors is assumed to encompass both interior and exterior doors.

Even a breeze as little as 10 MPH can exert a 5 pound force on a typical 3 foot x 6 foot 8 inch door. Stack pressures caused by pressure variations normally exert forces greater than 5 pounds with only minimal pressure differences. These forces make it difficult for a good percentage of the population to use manual doors, and doors that comply with all aspects of building codes may have difficulty meeting the 5 pounds maximum force limit.

Automatic doors require users to exert 0 pounds of force to operate, even in extreme wind and stack pressure situations, making automatic doors an ideal solution if you are interested in providing easy access for all.