

Sliding Automatic Doors and Energy Efficiency Codes

Introduction

Manufacturers of automatic pedestrian sliding doors are sometimes being asked to provide information about thermal transmittance and air infiltration. Most of the time, this information is being requested as a result of several energy efficiency codes and standards that have become more prominent recently. This AAADM Technical Bulletin will explain the subject, noting that automatic sliding doors were not considered when the codes were developed.

Background

Typically automatic door products are used in commercial applications and are installed into the exterior building envelope; therefore, they may be subject to the provisions of either the International Energy Conservation Code (IECC) or ASHRAE 90.1. In each of these documents, automatic doors are classified as "fenestration" products. As a result, the applicable sections of the IECC for automatic pedestrian doors are found in the "Building Envelope" section in the "Commercial Provisions" chapter "C-1", under the "fenestration" category (section C402.3, IECC, 2012).

U-factor and air leakage are two of the primary energy efficiency attributes of many fenestration building products, including automatic door assemblies.

- *U*-factor is a measure of heat transmittance. The lower the *U*-factor value, the less the component transmits heat (i.e., the better it performs). Prescriptive maximum values are assigned by the energy efficiency codes and standards, dependent on climate zone. A code official or a design professional may request a product's *U*-factor for prescriptive compliance or to help determine the *U*-factor for the entire building envelope.

For automatic doors, *U*-factor can be determined through physical testing and simulation, or an area weighted average *U*-factor can be calculated given some specific details about the door and glass construction.

- Air leakage is a measure of the total air flow in cubic feet per minute per square foot of door area. Compliance with air leakage requirements is mandatory. Building products, including automatic doors, must be tested in order to determine air leakage rating.

Applicability to Automatic Sliding Doors

Automatic doors and their unique configurations and means of operation were not considered when the energy conservation codes were developed. As a result, automatic doors are not listed in the codes, and the automatic door industry faces some challenges.

AAADM is a non-profit trade association of manufacturers of automatic doors and related equipment. AAADM is dedicated to enhanced professionalism throughout the automatic door distribution chain, to increased understanding and awareness of automatic doors, and to improved accessibility for all.

For example, air leakage maximum values are specified in the IECC (Table C402.4.3) for most building components, including “sliding doors.” This value does not apply to automatic pedestrian doors, despite the fact that some automatic doors do slide during operation. Understandably this presents a great deal of confusion when proof of compliance is required; however, further investigation clearly demonstrates that commercial power-operated automatic doors were not considered when the requirements were developed.

For further clarification, consider the requirement for a window. As specified in the IECC table, windows shall not leak more than 0.2 cfm/ft². This same value is listed for “sliding doors.” Doors and windows that meet this requirement, and for which the code was intended, slide in a fixed channel, are captured on all sides by “U-shaped” framing, and have aggressively engaged seals on all sides. Products with these design features leak very little air, but the compromise is that while they slide smoothly, they do not slide freely. All such products require a considerable amount of force to open or close. Think of sliding patio doors as being representative of this type of product.

For commercial power-operated pedestrian doors, the most important requirement is to provide an entrance that is safe for pedestrians. First, automatic pedestrian doors must be equipped with a mandatory break-out feature. In addition, power-operated pedestrian sliding doors must limit the amount of force required to slide the door. The specific forces can be found in many standards, but the most common references are to the *International Building Code* ®, the *Life Safety Code* ® and ANSI/BHMA 156.10 standard. The door must be able to move freely.

Contrary to the “sliding doors” addressed in the IECC and other energy efficiency codes and standards, the sliding automatic pedestrian door products have more clearance between fixed and moving components, the seals are engaged less aggressively, and the fixed framing cannot completely encapsulate the top and bottom of the door. These inherent design features are present in all automatic pedestrian doors from all manufacturers. While these automatic doors are energy efficient, their intended use precludes adoption of the very strict air leakage requirements specified in the codes.

Surprisingly, this contradiction between energy efficiency and intended operation was captured for “commercial glazed *swinging* entrance doors” in the codes. The air infiltration requirements for these products was adjusted in the energy codes from 0.2 cfm/ft² up to 1.0 cfm/ft².

The American Association of Automatic Door Manufacturers (AAADM) is working to resolve this issue with code organizations and other standards development organizations. AAADM is developing the appropriate values, testing, and configurations for automatic door compliance. These initiatives take time, and we are working diligently to have the codes include appropriate requirements for automatic doors.

AAADM is a non-profit trade association of manufacturers of automatic doors and related equipment. AAADM is dedicated to enhanced professionalism throughout the automatic door distribution chain, to increased understanding and awareness of automatic doors, and to improved accessibility for all.