



Smoke and Draft Control Door Assemblies

Designers and code authorities often have questions about how smoke and draft control door assemblies are certified, and want to know what markings should be provided on the assemblies to show compliance with building code requirements.



Fire door assemblies have been utilized for decades to protect openings in fire-resistance-rated construction. These doors are evaluated for their fire performance in accordance with the requirements of UL 10A, the Standard for Safety of Tin-Clad Fire Doors, UL 10B, the Standard for Safety of Fire Tests of Door Assemblies, or UL 10C, the Standard for Safety of Positive Pressure Fire Tests of Door Assemblies. In more recent times, draft and smoke control door assemblies have been utilized to limit the smoke migration through door openings. These draft and smoke control door assemblies are tested in accordance with UL 1784, the Standard for Safety of Air Leakage Tests of Door Assemblies. (Provisions from this Standard were previously included in the Uniform Building Code Standard UBC 7-2, Part II.)

Building code requirements

Various provisions of the International Building Code (IBC) require doors to meet the requirements for a smoke and draft

control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly is not allowed to exceed 3.0 cubic feet per minute per square foot of door opening at 0.10 inch of water for both the ambient temperature test and the elevated temperature (400 °F) exposure test. However, this is only applicable when the doors are installed, as specified in the 2012 IBC, in the following applications:

- Smoke partitions (Section 710.5.2.2)
- Enclosed elevator lobbies (Section 713.14.1, exception 3)
- Corridors and smoke barriers (Section 716.5.3.1)
- Fire service access elevator lobbies (Section 3007.7.3)
- Occupant evacuation elevator lobbies (Section 3008.7.3)

Section 716.5.7.3 requires smoke and draft control doors that comply with UL 1784 to include the letter “S” on the fire-rating label of the door. This marking is intended to indicate that the



Smoke and Draft Control Door Assemblies (continued)

door and frame assembly are in compliance when listed or labeled gasketing is also installed.

Certification Considerations

Certifications (Listing and Classifications) of doors which have been either fire tested or tested for their leakage characteristics, or both, are published in the UL Fire Resistance Directory, the Fire Resistance Directory on CD-ROM and the Online Certifications Directory, at www.ul.com/database. Draft and smoke control door assemblies meeting the code requirements for leakage can be provided in one of two ways:

First, a UL Classified swinging fire door, fire tested under a positive furnace pressure and leakage tested as a smoke and draft control door may be installed in conjunction with a UL Listed fire door frame and a UL Classified Category H gasketing material for fire doors. These positive pressure fire doors are certified under the Positive-pressure Tested Swinging-type Fire Doors (GSZN) product category and bear a UL Classification Mark that includes the fire rating. In addition, those doors that have also been tested in accordance with UL 1784 are eligible to bear a mark that reads “Smoke and Draft Control Door” or the letter “S”. Fire door frames used in conjunction with these doors are Listed under the Fire Door and Window Frames (GVTV) product category and bear a UL Listing mark. Listed frames whether of a welded or knocked down style are appropriate for use in smoke and draft control applications without the need for further markings.

The Category H gaskets used in conjunction with these doors and frames are Classified under the Positive-pressure Tested Gasketing and Edge-sealing Materials for Fire Doors (GVYI) product category. The gaskets are surface applied to the door and/or the frame so the overall assembly can comply with the air leakage requirements of the codes. The Category H gaskets are either Classified for general use on all products in a door type family, or limited to individual door manufacturers, as noted in the individual Classifications. Since the Classification Marking is applied to the gasket packaging, it is not verifiable after installation of the gasket.

Alternately, door assemblies, consisting of specific doors, frames, gasketing, hardware and other accessories which have been



evaluated as a smoke and draft control door assemblies only are Classified under the Leakage-rated Door Assemblies (OPBW) product category. Leakage-rated door assemblies under this product category are intended for installation in accordance with the installation instructions provided with each leakage-labeled component product. The products are intended primarily for field installation in accordance with installation instructions packaged with the leakage-labeled components, but may be factory assembled.

Information concerning the specific air-leakage rating, mounting locations, installation clearances, and the like is provided in the detailed installation instructions accompanying each leakage-labeled component product.

Installation Considerations

Smoke and draft control door assemblies are intended to be installed in accordance with the Standard for Smoke Door Assemblies and Other Opening Protectives, NFPA 105, and the Standard for Fire Doors and Other Opening Protectives, NFPA 80.

Smoke and draft control doors are required to be self-closing or automatic closing in accordance with NFPA 80. Automatic closing smoke door assemblies shall be activated by smoke detection installed in accordance with the National Fire Alarm and Signaling Code, NFPA 72.