



Edge Sealing Systems, Smoke and Draft Control Gasketing for Positive Pressure Fire Door Assemblies

The International Building Code (IBC)

The International Building Code (IBC) requires swinging fire doors to be tested in accordance with ANSI/UL 10C or NFPA 252, with the neutral pressure level established at 40 inches or less above the sill. This causes “positive pressure” forces against the door assembly above 40 inches.

The result is hot gases and smoke leak out between the door and frame above this level, posing a serious threat to life-safety; and on wood doors rapidly deteriorating the integrity of the door edges, requiring either a built-in or supplemental “edge sealing system” to pass the test.

Fire door assemblies in corridors and smoke barrier walls are required to be smoke and draft control assemblies tested in accord with UL1784 allowing a maximum air leakage of 3 cubic feet per minute per square foot of door opening at ambient temperature (75°F) and elevated temperature (400°F). These assemblies require the letter “S” on the fire rating label of the door indicating compliance “when listed or labeled gasketing is also installed.”

Fire doors are classified into category **A** or **B** based upon their construction and edge sealing system requirements. Fire-rated gasketing is classified as follows:



Category G - Edge Sealing Systems



Category H - Smoke and Draft Control Gasketing



Category J - Gaskets other than Category G or H.

Category A certified fire doors:

Hollow Metal Fire-Rated Doors
Wood Fire-Rated Doors constructed with edge seals built-in during the manufacturing process.

Require Category H – Smoke and Draft Control Gasketing at **perimeter** and at **meeting edge of pairs** of “S” label doors in corridor locations or smoke barrier walls.

Require Category H – Smoke and Draft Control **door bottom seals** on “S” label doors where pressurization is provided to restrict smoke movement (typically controlled by HVAC system).

The following products are recommended UL classified Category H for wood doors - 90 min. max., hollow metal doors - 3 hour max.



Perimeter: 2525, 5020, 5025, 5040, 5050, 5070, 5075



Meeting edge of pairs: 115N, 125N, 137N, 137S, 5070, 9115, 9125, 9600, 9605

Category B certified fire doors:

Wood Fire-Rated Doors that require the addition of a Category G classified edge sealing system in the field.

Require Category G – Edge Sealing System, at **perimeter** and at **meeting edge of Pairs**.

Require Category H – Smoke and Draft Control Gasketing at **perimeter** and at **meeting edge of pairs** of “S” label doors in corridor locations or smoke barrier walls.

Require Category H – Smoke and Draft Control **door bottom seals** on “S” label doors where pressurization is provided to restrict smoke movement (typically controlled by HVAC system).

The following products are recommended UL classified for both category G and H:



Perimeter 20 minute: 5050
 Perimeter 45, 60, 90 minute: 9450, 9550, 9750, 9850



Meeting edge of pairs: 9550

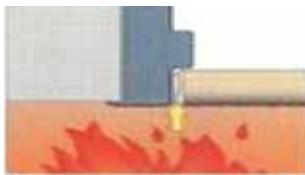


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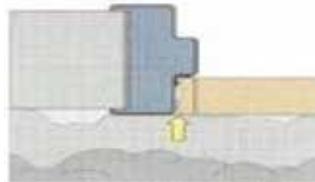
History: Those responsible for drafting the Uniform Building Code included in the 1997 revision a requirement for Fire Door Assemblies to be tested with the Neutral Pressure Plane regulated at 40" above the sill. The revised code also required many fire-rated doors (mostly doors at corridors) to be Smoke and Draft Control Assemblies. The UBC test standard 7-2 "Fire Tests of Door Assemblies" was revised to include the new criteria. Many western states quickly adopted the 1997 version of the Uniform Building Code, which for the first time in the United States required fire doors to meet a fire test under positive pressure conditions.

Manufacturers had to test all doors, frames and hardware to the new test standard. In so doing the wood door manufacturers found it necessary to use an edge sealing system to seal the gap between the door and the frame and protect the edge of the door from deteriorating during the more intense positive pressure fire test. The materials they used initially were intumescent type seals that expand approximately 10 times their original size when they reach a temperature of around 375 degrees. These edge seals were required to be furnished in order for the door to bear the positive pressure fire label and meet UBC 7-2 (1997).

NGP Seals Stop Fire Spread



NGP Gaskets Stop Smoke Spread



NGP-EDGE® SEALING SYSTEM is Category G certified for use on Category B listed wood doors.



SMOKE & DRAFT CONTROL GASKETING, is Category H certified for use on "S" labeled doors.

Wood doors that have a factory installed edge sealing system under the veneer are listed by both UL and Warnock Hersey as Category A doors.

Wood doors that require a supplemental Edge Sealing System installed in the field on either the edge of the door or on the frame opposite the edge of the door are listed by both UL and Warnock Hersey as Category B doors.

Today, both testing labs confirm that NGP Edge Sealing Systems (Category G certified) can be used on ANY listed Category B fire-rated wood door up to the maximum rating of either the door or the gasket.

UL Test standard UL10C is Underwriter's Laboratories standard for testing of fire door assemblies to positive pressure with the neutral plane at 40" above the sill. This test standard is required to be met for all fire doors installed in jurisdictions that have adopted the International Building Code (IBC). The requirement for Smoke and Draft Control assemblies is also stated in IBC.

Today: A variety of seals have now been tested including intumescent and some silicone seals. These seals have been separately categorized to indicate their unique ratings by the testing labs, UL and Warnock Hersey.