

Design Guidelines:

Application

Doors constructed as described in this procedure meet the requirements for both positive and neutral pressure fire tests, UBC 7-2 (1997), UL-10C (1998), NFPA 252 (1999), and CAN S104 (1985) including the hose stream. Pairs must have a separating mullion or 4-point latching. Pairs with 3-point latching and astragal rated for 60 minutes. Doors used in neutral pressure applications may not require the use of intumescent materials, smoke gasketing, or a combination thereof. Options include frame mounting the intumescent and/or smoke gasketing, mortising the intumescent into the door perimeter, concealing the intumescent with the stile(s), or a combination of these methods. The options available depend on the door's application and are described in the edge-sealing section.

Doors labeled for positive pressure applications must include installation instructions to be furnished by the door labeler. Unless otherwise noted in the door's installation instructions all intumescent materials and smoke/draft control gasketing used in the assembly are to be installed per their respective manufacturer's instructions.

Limitations

- Mortise or cylindrical latches with maximum 5" backset allowed
- Surface-mounted vertical rod or roller vertical rod fire exit devices allowed
- Rim-type fire exit devices allowed
- Deadbolts allowed
- Surface bolts and mortised flush bolts allowed
- Surface-mounted closers allowed
- Surface-mounted protection plates allowed
- Viewer allowed
- Vision Lite Kits: 20 to 45 min. rated doors max 616 in.² D.L.O. each lite, max 1232 in.² total D.L.O., 60 & 90 min. rated doors max 100 in.² D.L.O. when using wired glass, max 704 in.² D.L.O. when using Fire Rated Ceramic Type Glass.
- Glass over 100 in.² voids temperature rise requirements per NFPA 80.
- Surface-mounted door bottoms allowed
- Stainless steel edge guard required
- Rated for a maximum temperature rise - < 250 °F at 30 minutes

Plant-ons

Not allowed

Hardware

Preparation shall be made in accordance with NFPA 80, Paragraph 1-3.4. Only hardware listed and labeled for use with wood fire doors may be installed.

- **Hinges**
 - Per NFPA 80, Table 2-4.3.1
 - Continuous Hinges
 - Spring hinges per NFPA 80
- **Latchsets**
 - Min. latch bolt throw shall be 3/4"
 - **Cylindrical**
 - Max bore: 2-1/8", Max backset 5", Min. distance from the edge of latch cutout to edge of door: 1-13/16"
 - **Mortise**
 - Max cutout 1-1/16" wide x 4-1/2" deep x 6" long
 - **Fire Exit Devices**
 - Surface-mounted vertical rod or roller vertical rod
 - Less bottom rod 45 min. or lower durations with door to door or door to floor fire pen on both leaves
 - Rim-type surface-mounted

Design Guidelines (cont.):

- **Fire Exit Devices (cont.)**
 - Mortise-type exit devices
 - Note: Surface mounted exit devices shall be installed with through bolts unless inner blocking is provided.
- **Deadlock**
 - Cylindrical with a max 2-1/8" diameter bore located a minimum of 5" above latch cutout
 - Mortise deadlock is allowed (refer to Mortise Latchset for cutout) located a minimum of 5" above latch cutout
- **Door Bolts**
 - Surface-mounted manual
 - Mortised automatic/manual
- **Door Bottoms**
 - Surface-mounted
- **Closing Devices**
 - Surface-mounted installed with through bolts or if inner blocking is provided, wood screws may be used
- **Viewers**
 - Listed viewers may be used
- **Protection Plates**
 - Plates of brass, bronze, steel, aluminum, polycarbonate or decorative laminate may be installed on one or both sides of the door. Top of plate located a max of 16" from bottom of the door. Attached with #6 x 3/4" wood screws spaced a min. of 6" on center and/or adhesive.

Edge-Sealing System

Pemko HSS 2000xS88 (or listed and labeled equivalent) is field-applied to jambs and head. Pemko S771 (or listed and labeled equivalent) smoke seal is applied to meeting edges.

Edge Channels

0.062" thick 3/4" leg stainless steel edge channels are part of the standard construction and applied to the entire perimeter of the door, sealed by 3M CP 25WB+ Fire Barrier Caulk applied to the inside edges of all the stainless steel edge channels. Attached with #10 x 1-1/4" screws, max 2" from the end and 12" O.C.

Vision Lites

- 60 to 90 min.
 - Max Area (D.L.O.): 704 in²
 - Max Height (D.L.O.): 32"
 - Max Width (D.L.O.): 22"
- Wired Glass
 - Max Area (D.L.O.): 100 in²
 - Max Height (D.L.O.): 10"
 - Max Width (D.L.O.): 10"
- 20 to 45 min.
 - Max Area (D.L.O.) Each Lite: 616 in²
 - Max Total Area (D.L.O.): 1232 in²
 - Max Height (D.L.O.): 28"
 - Max Width (D.L.O.): 22"

Multiple lites are allowed when the sum of the areas do not exceed the tested maximum area or the maximum height and width limitations. No lite cutout may come within 5" of the door edge or the edge of any other cutout in the door. Only fire-rated glazing installed in fire-rated vision lites, listed and labeled for use in wood fire doors shall be used. The glass shall be installed in accordance with NFPA 80 and the vision lite installation instructions.

Louvers

Max width: 24", Max Height: 24", Max Area: 576 in²

Design Guidelines (cont.):

Raceways

- Maximum size 3/8" x 3/8" that are routed into the core edge joints during door construction or round raceways that are drilled 3/8" diameter holes are allowed.
- Raceways to be centered in the door core thickness no more than 40" above the bottom of the door edge.
- Raceways are to be located from the latch to an EPT or Hinge location opposite of the latch.
- Raceways must be installed by certified raceway installer or core manufacturer.

Clearances

- A maximum 1/8" clearance between the frame and the door is allowed.
- A maximum 3/16" clearance between the leaves of pairs is allowed.

Final Checklist:

Single swing or standard pair

D.O. is $\leq 48"$ x $96"$ for single door or $\leq 96"$ x $96"$ for double doors

Undercut $\leq 3/4"$

Hinge clearance $\leq 1/8"$ unless otherwise specified by hardware manufacturer

Lock clearance $\leq 1/8"$ ($3/16"$ between pairs)

Head clearance $\leq 1/8"$

Rim x Rim w/listed mullion (90 min.), 4-point latching (90 min.) or separating mullion

Hardware configuration provides for 3-point latching (60 min.) or separating mullion

Raceways horizontal from device to hinge or EPT and $\leq 40"$ from bottom of door

Vision Lites are sized correctly

Face sheet is Pebble FRP, Sandstone Texture FRP, Contemporary Woodgrain FRP, or Rustic Woodgrain FRP

Louvers are sized correctly

ESTIMATOR

DETAILER

PRODUCTION