

Opening Protectives

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From the well-known blog idighardware.com, Lori Greene brings some much-needed clarity to codes.

Over the years, I've heard many people mention the rule of thumb that the rating of a fire door assembly is "3/4 the rating of the wall." Although the fire door rating is typically less than the rating of the wall, the 3/4 ratio doesn't always apply. The required rating for a fire door depends on the type of wall assembly (fire wall, shaft, corridor, smoke barrier, etc.) and the wall's required rating. These hourly ratings indicate the length of fire test exposure and the duration of fire protection provided by the assembly.

The International Building Code (IBC) and NFPA 101 – The Life Safety Code each contain a table that specifies the fire door assembly rating for each corresponding wall assembly. For example, a fire wall with a three-hour rating requires a fire door assembly with a three-hour rating.

A one-hour rated smoke barrier wall requires a 20-minute rated door. The table from NFPA 101 includes the ratings for fire window assemblies, as well as fire door assemblies. The IBC has separate tables for each; fire door assembly ratings are shown in Table 715.4, and fire window assembly ratings are in Table 715.5 (2009 edition).

While we're on the subject, people always ask me why the rating of the door isn't the same as the rating of the wall. It's because there's the potential for a higher fuel load adjacent to the wall—for example, furniture, shelves or stored items. The door should theoretically have no fuel load in direct contact with it. For this reason, NFPA 80 states that fire-rated doors that are no longer used should be removed and replaced with the appropriate wall material rather than permanently closed. I recently

TABLE 715.4
FIRE DOOR AND FIRE SHUTTER FIRE PROTECTION RATINGS

TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3
	3	3 ^a
	2	1½
	1½	1½
Fire barriers having a required fire-resistance rating of 1 hour: Shaft, exit enclosure and exit passageway walls Other fire barriers	1	1
	1	¾
Fire partitions: Corridor walls Other fire partitions	1	⅓ ^b
	0.5	⅓ ^b
	1	¾
	0.5	⅓
Exterior walls	3	1½
	2	1½
	1	¾
Smoke barriers	1	⅓ ^b

a. Two doors, each with a fire protection rating of 1½ hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.

b. For testing requirements, see Section 715.4.3.

From the 2009 edition of the International Building Code (IBC)

Washington DC: International Code Council.
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From the 2009 edition of NFPA 101 – The Life Safety Code:

Table 8.3.4.2 Minimum Fire Protection Ratings for Opening Protectives in Fire Resistance-Rated Assemblies

Component	Walls and Partitions (hr)	Fire Door Assemblies (hr)	Fire Window Assemblies (hr)
Elevator hoistways	2	1½	NP
	1	1	NP
Vertical shafts (including stairways, exits and refuse chutes)	2	1½	NP
	1	1	NP
	½	⅓	NP
Fire barriers	3	3	NP
	2	1½	NP
	1	¾	¾
	½	⅓*	⅓
Horizontal exits	2	1½	NP
Horizontal exits served by bridges between buildings	2	¾	¾
Exit access corridors†	1	⅓	¾
	½	⅓	⅓
Smoke barriers†	1	⅓	¾
Smoke partitions‡	½	⅓	⅓

NP: Not Permitted.


† Fire doors are not required to have a hose stream test per NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*; ASTM E 2074, *Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies*; ANSI/UL 10B, *Standard for Fire Tests of Door Assemblies*; or ANSI/UL 10C *Standard for Positive Pressure Fire Tests of Door Assemblies*.

‡ For residential board and care, see 32.2.3.1 and 33.2.3.1.

went looking for some fire doors in a hospital and found them behind large bookcases!

Consult the tables in this article (or the applicable tables from your local codes) to determine the required rating of a fire door assembly.

Here’s the text from NFPA 80 Annex K in regard to the removal of unused fire doors:

K.5. Despite the provision of protection specified in this standard, walls with openings have less fire resistance than unpierced walls. Fire doors, shutters, and fire windows are designed to protect an opening under normal conditions of use, with a clear space on both sides of the opening. Where the opening is not used and combustible material is piled against the door, window, or shutter, the designed protection cannot be expected. For that reason, combustible material should be kept well away from openings. Where a door or window opening is no longer in use, the opening should be closed with construction having a fire resistance rating equivalent to that of the wall. 

About the Author: Lori Greene, AHC/CDC, CCPR has been involved in the door and hardware industry since 1986. She is currently the Specification Team Lead for Ingersoll Rand Security Technologies. Lori holds a degree in Architecture and Building Engineering Technology from Vermont Technical College and is a member of the NFPA and ICC.

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