

TECHNICAL

TESTING - One, Two...

By Steve Hahn

For quite a few years now, NFPA 80 and model building codes have mandated the annual inspection and drop testing of rolling fire doors. Unfortunately, fire doors are too often drop tested by untrained persons that lack the knowledge, ability or tools to properly inspect, test and reset them. When that happens, there is an opportunity for a fire door that might close successfully during a drop test to then be reset incorrectly afterwards – leaving it unprepared to do its job and a risk of a potential tragedy in the event of a fire.

As a result of those concerns, the 2007 edition of NFPA 80 Standard for Fire Doors and Other Opening Protectives now requires that rolling fire doors be drop tested twice – once to demonstrate proper operation and full closure, and a second time to verify that the automatic closing device has been reset properly.¹ Additionally, testing must be done by persons with knowledge about and an understanding of the operating/closing system of the door being tested.²

What does this inspection and drop test process really involve? Chapter 5 of the 2007 edition of NFPA 80 addresses the entire topic of care and maintenance of fire doors. Section 5.2 deals with inspections and testing, and sub-sections within 5.2 cover requirements applicable to specific types of fire doors as well as other general requirements.

VISUAL INSPECTION

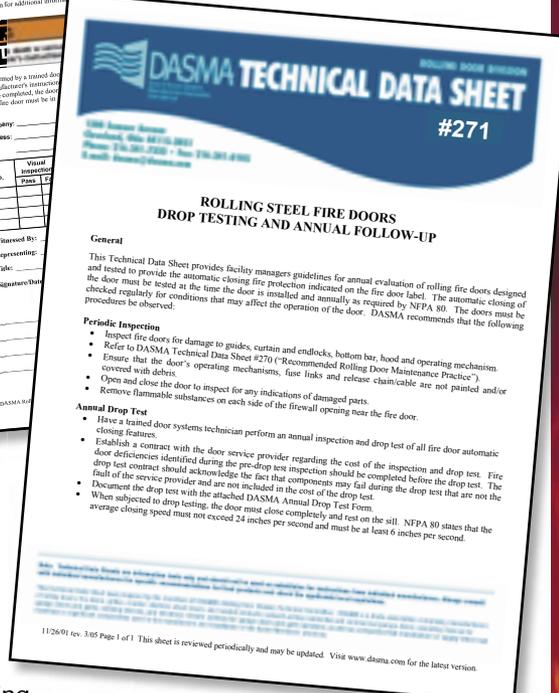
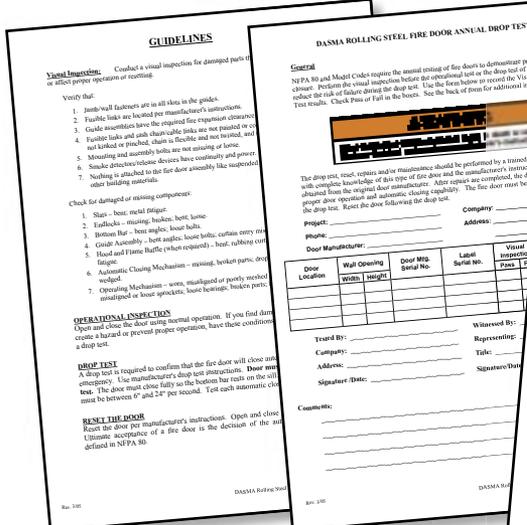
A rolling fire door must be visually inspected to evaluate its overall condition prior to being drop tested.³ Following are the more common items to be inspected.⁴

- Slats must not be bent, cracked, torn, separated, have open holes, or otherwise be damaged.
- Endlocks cannot be missing, broken, bent or loose.
- Bottom bar must not have bent angles, missing or loose assembly bolts.*
- Guides cannot have bent angles or channels, missing or loose assembly or wall bolts.* Curtain entry at the top of the guides must be unobstructed.

** Some door designs require "special" washers – such as fiber, plastic, hot-dipped galvanized steel (not just plated steel) – on assembly and wall bolts.*

- Expansion clearance must be provided in accordance with manufacturers' installation instructions. Most older fire doors were designed with downward expansion, requiring the guides to be set

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above the floor, with a specified clearance beneath the guides, and with wall bolts installed in the bottom of the slots in the wall angles. Many newer doors are designed with upward expansion, allowing the guides to be set on the floor, but requiring expansion clearance above the door, with wall bolts installed in the top of the slots in the wall angles.

- Hood – and flame baffle or fascia if provided – cannot be bent, dented, have holes, or otherwise be damaged. If the hood is provided with slots in the top flange, it must be attached to the wall with appropriate fasteners in all slots. If intermediate hood supports are required, they cannot be missing.
- Automatic closing device, governor, and operating mechanisms cannot have missing, broken or misaligned parts. Drop out arms/levers cannot be blocked, wedged or otherwise prevented from releasing.
- Fusible links (and detectors) must be properly installed and located where required per NFPA 80.⁵ A door must close automatically upon separation of any one of the fusible links. Fusible links must be in their original condition – they cannot be painted, otherwise coated, or have an accumulation of dust, grease, or other debris because it may prevent them from separating at the intended temperature. Sash chains/cables

cannot be kinked, pinched, twisted or otherwise restricted from being flexible and moving freely.

Any damage that could compromise the performance of the door in a fire condition must be repaired without delay⁶ and with parts obtained from the original manufacturer of the door.⁷ And any conditions that may effect the operation of the fire door during the drop test must be corrected prior to the drop test.

OPERATIONAL CHECK

After the door is visually inspected, it's a good idea to open and close the door in normal operation – by manual push/pull, hand chain, crank or motor – to verify that it is free of any obstructions, is properly balanced, and doesn't have any "hidden" problems that might adversely effect the operation of the door during the drop test. If a fire door doesn't roll up and down properly in normal operation, there's a pretty good chance it won't pass a drop test. Not only may it not pass, but there's an increased chance of the door or the building being damaged or of someone being hurt in the process.

Continued on page 68

“Inspecting and drop testing fire doors is a serious business.”

1 NFPA 80, 5.2.14.3.3 4 NFPA 80, 5.2.5.2 and DASMA TDS-271 7 NFPA 80, 5.2.15.3 10 NFPA 80, 5.2.14.3.1
 2 NFPA 80, 5.2.3.1 5 NFPA 80, 4.7 8 NFPA 80, 11.4.1.5 11 NFPA 80, 5.3
 3 NFPA 80, 5.2.3.2 6 NFPA 80, 5.1.5.1 9 NFPA 80, 11.4.1.3 12 NFPA 80, 5.2.14.3.2

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DROP TESTS

The next step is to drop test the fire door.

- A rolling fire door must be drop tested from the fully open position.
- For a door with fusible links, it is generally accepted that it be tested from the release point the furthest from the door. The Authority Having Jurisdiction (AHJ) may require that a fusible link be heated to separate – rather than just disconnecting it from the cable/sash chain – and then replaced.
- For a door with other types or multiple means of activation, the AHJ may require that it be tested by most or all activation means. In other words, if a fire door can be activated by fusible links and detectors, then the AHJ might require that it be tested from the fusible links, as well as from detectors at the door opening.
- The door must automatically close at an average rate of no faster than 24 inches (2 feet) per second but no slower than 6 inches (1/2 foot per second).⁸
- The bottom bar must come to rest in the closed position (on the floor or counter top).⁹

After the first drop test, open the door and reset the automatic closing device per the manufacturer's installation instructions.¹⁰ If the drop test was successful, reset the door the way it was prior to the test. If the drop test was not successful, make necessary adjustments – if there are any available to be made.

Then, drop test the door again. If both drop tests were successful, then open and reset the door again and

consider testing complete. If not, reset the door, make adjustments, and test again. Two successful drop tests are required. If the door cannot be successfully drop tested twice, then the door requires repair or replacement. (Remember that the use of a labeled retrofit fire door operator may be a suitable solution for an improperly operating fire door. Its use is permitted by NFPA 80).¹¹

WRITTEN RECORD

The final step in the inspection and drop test process involves documentation. A written record must be maintained and made available to the AHJ.¹² The Door and Access Systems Manufacturers Association (DASMA) has inspection and drop test forms and labels available for this purpose. DASMA also publishes a number of technical data sheets (TDS) that can be a valuable resource for information about fire doors and are available on their website www.dasma.com.

Inspecting and drop testing fire doors is a serious business. It truly is not something that just anyone can do. It can be very complex and potentially dangerous and is definitely best handled by a trained door systems technician. A rolling fire door may be the largest piece of moving equipment in a facility, and that potentially very large and heavy piece of equipment will be moving even faster than normal when it is drop tested!



Steve Hahn is Product Manager for Lawrence Roll-Up Doors, Inc. He has been in the rolling door industry for more than 30 years, is a member of the NFPA-80 Standard for Fire Doors and Other Opening Protectives Technical Committee, and serves on three UL Standards Technical Panels.