



**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.<sup>1</sup> Additionally, testing must be done by persons with knowledge about and an understanding of the operating/closing system of the door being tested.<sup>2</sup>

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.<sup>3</sup> Following are the more common items to be inspected.<sup>4</sup>

- 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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## GUIDELINES

**Visual Inspection:** Conduct a visual inspection for damaged parts or affect proper operation of opening.

Verify that:

1. Jamb/wall fasteners are in all slots in the guides.
2. Fusible links are located per manufacturer's instructions.
3. Guide assemblies have the required fire expansion clearance.
4. Fusible links and guide chain/cable links are not painted or coated.
5. Fusible links and guide chain/cable links are not twisted, bent, not linked or frayed, chain is flexible and not twisted, and not linked or frayed.
6. Mounting and assembly bolts are not missing or loose.
7. Nothing is attached to the fire door assembly, the suspended chain or other building materials.

Check for damaged or missing components:

1. Sash - bent, metal fatigue.
2. Endflashes - missing, broken, bent, loose.
3. Bottom flange - bent, missing, loose, holes.
4. Guide Assemblies - bent, missing, loose, holes, missing or damaged.
5. Hood and Flame Baffle (when required) - bent, missing, damaged.
6. Automatic Closing Mechanism - missing, broken parts, over-tight.
7. Operating Mechanism - worn, misaligned or poorly installed.

**OPERATIONAL INSPECTION:** Open and close the door using normal operation. If you find damage, create a hazard or prevent proper operation, have these conditions a drop test.

**DROP TEST:** A drop test is required to confirm that the fire door will close in an emergency. Use manufacturer's drop test instructions. Door must close fully to the bottom bar track on the sill.

**RESET THE DOOR:** After the drop test, reset the door to its normal operation. Open and close the door several times to ensure proper operation. The door must be between 6" and 24" per second. Test each automatic closing device between 6" and 24" per second. Test each automatic closing device between 6" and 24" per second. Test each automatic closing device between 6" and 24" per second.

## DASMA ROLLING STEEL FIRE DOOR ANNUAL DROP TEST FORM

### General

The drop test, reset, repair and maintenance should be performed by a trained door technician. The drop test is required for all fire doors and the automatic closing device must be tested annually. The drop test is required for all fire doors and the automatic closing device must be tested annually. The drop test is required for all fire doors and the automatic closing device must be tested annually.



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Door Location	Width (inches)	Height (inches)	Door Weight (lbs)	Label Serial No.	Visual Inspection Pass/Fail

Tested By: \_\_\_\_\_ Company: \_\_\_\_\_ Address: \_\_\_\_\_

Signature (date): \_\_\_\_\_

Comments: \_\_\_\_\_



## ROLLING STEEL FIRE DOORS DROP TESTING AND ANNUAL FOLLOW-UP

### General

This Technical Data Sheet provides facility managers guidelines for annual evaluation of rolling fire doors designed and tested to provide the automatic closing fire protection indicated on the fire door label. The automatic closing of the door must be tested at the time the door is installed and annually as required by NFPA 80. The doors must be checked regularly for conditions that may affect the operation of the door. DASMA recommends that the following procedures be observed:

### Periodic Inspection

- Inspect fire doors for damage to guides, curtain and endlocks, bottom bar, hood and operating mechanisms.
- Refer to DASMA Technical Data Sheet #270 ("Recommended Rolling Door Maintenance Practice").
- Ensure that the door's operating mechanisms, fuse links and release chain/cable are not painted and/or covered with debris.
- Open and close the door to inspect for any indications of damaged parts.
- Remove flammable substances on each side of the fire wall opening near the fire door.

### Annual Drop Test

- Have a trained door systems technician perform an annual inspection and drop test of all fire door automatic closing features.
- Establish a contract with the door service provider regarding the cost of the inspection and drop test. Fire door test contract should acknowledge the fact that components may fail during the drop test. The door must be reset to its normal operation after the drop test.
- Document the drop test with the attached DASMA Annual Drop Test Form.
- When subjected to drop testing, the door must close completely and test on the sill. NFPA 80 states that the average closing speed must not exceed 24 inches per second and must be at least 6 inches per second.

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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.<sup>5</sup> 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 delay<sup>6</sup> and with parts obtained from the original manufacturer of the door.<sup>7</sup> 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  
2 NFPA 80, 5.2.3.1  
3 NFPA 80, 5.2.3.2  
4 NFPA 80, 5.2.5.2 and DASMA TDS-271  
5 NFPA 80, 4.7  
6 NFPA 80, 5.1.5.1

7 NFPA 80, 5.2.15.3  
8 NFPA 80, 11.4.1.5  
9 NFPA 80, 11.4.1.3

10 NFPA 80, 5.2.14.3.1  
11 NFPA 80, 5.3  
12 NFPA 80, 5.2.14.3.2

## TECHNICAL

# TESTING - One, Two...

### 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).<sup>8</sup>
- The bottom bar must come to rest in the closed position (on the floor or counter top).<sup>9</sup>

After the first drop test, open the door and reset the automatic closing device per the manufacturer's installation instructions.<sup>10</sup> 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).<sup>11</sup>

### 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.<sup>12</sup> 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](http://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!



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