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Rolling Steel Fire Doors and Balanced Fire Protection

Introduction

DASMA supports the principle of “balanced fire protection”, historically referred to as containment, compartmentalization and suppression, in building construction. In recent times there has been a shift toward suppression as the primary means of fire protection. This is best reflected in the publishing of the initial version of the International Building Code in 2000. A number of provisions favoring suppression, known for many years as “sprinkler trade-offs”, were incorporated into the IBC. Some of these “trade-offs” involved the reduction or elimination of rated walls in lieu of automatic fire suppression systems such as automatic sprinklers.

DASMA has received inquiries from various parties regarding the use of automatic fire suppression systems, including sprinkler systems designed to form “water curtains”, in lieu of fire-rated rolling steel doors. The following questions and answers will help clarify issues relating to such “trade-offs”.

What is “balanced fire protection”?

Balanced fire protection is where a building is designed with a balance of “active” protection systems (e.g. automatic sprinklers) and “passive” protection systems (e.g. fire-rated walls) to maximize property protection, minimize personal injury/death and facilitate emergency responders.

What role do rolling steel fire doors play in fire resistance?

Rolling steel fire doors are commonly used in buildings where interior firewalls have been constructed to separate areas within building to contain potential fires within the building spaces. Such doors can also be used in exterior applications to protect against fire risk from adjacent buildings. Wall construction within buildings requiring fire rated walls could be specified to be carry a 4, 3, 1 ½ or ¾ hour fire ratings. Typically, openings in firewalls are protected by fire rated rolling steel doors.

Note: Technical Data Sheets are information tools only and should not be used as substitutes for instructions from individual manufacturers. Always consult with individual manufacturers for specific recommendations for their products and check the applicable local regulations.

This Technical Data Sheet was prepared by the members of DASMA's Rolling Door Division Technical Committee. DASMA is a trade association comprising manufacturers of rolling doors, fire doors, grilles, counter shutters, sheet doors, and related products; upward-acting residential and commercial garage doors; operating devices for garage doors and gates, sensing devices, and electronic remote controls for garage doors and gate operators; as well as companies that manufacture or supply either raw materials or significant components used in the manufacture and installation of the Active Members' products.

When the three major model building codes were consolidated into the IBC, were there any provisions changed affecting fire-rated rolling steel doors?

Yes. Two sets of provisions within the IBC allow for eliminating the use of such doors. One provision allows for elimination of ¾ hour rolling steel doors when a building is equipped with an automatic fire suppression system. The other provision allows for the elimination of a fire rating for any exterior rolling steel door if a “water curtain” is installed. These provisions are commonly known as “sprinkler trade-offs.”

What is a “sprinkler trade-off”?

Generally, the term “sprinkler trade-off” means that fire-resistance requirements for certain building materials are reduced or eliminated when various automatic fire suppression systems, e.g. sprinklers, are incorporated into a building’s design.

If an automatic fire suppression system is present, why should rolling steel fire doors be considered?

The use of rolling steel fire doors in conjunction with an automatic fire suppression system offers a superior level of safety to protect life and property. Such doors are designed to automatically close to help contain fire conditions, while automatic sprinklers help extinguish fire conditions. Further, any concerns about the reliability of automatic fire suppression systems (e.g. frozen piping, unavailability of outside water service, disconnection of service, system malfunction) can be balanced by the inclusion of rolling steel fire doors.

What can happen if a large opening is covered by a non-fire rated rolling steel door?

A large opening covered by a rolling steel door that is not fire rated will not automatically close under fire conditions, allowing an opportunity for fire and burning objects to pass through from one side of the opening to the other and thus setting up the possibility for compromising life and property.

What if a “water curtain” ends up being specified instead of a rolling steel fire door?

If a “water curtain” is specified to protect a rolling steel door in lieu of a fire-rated door, it should be designed for use with the specific rolling steel door installed. For the “water curtain”, keep in mind that the IBC requires compliance with NFPA 13, an automatic water supply and a fire department connection. Projectiles through a wall opening are not contained by a water curtain, but can be successfully contained by a rolling steel fire door.

What additional features can rolling steel fire doors provide besides fire resistance?

In addition to fire resistance and prevention of the passage of projectiles, rolling steel fire doors can also be rated as smoke door assemblies. The rolling steel fire door industry can supply doors tested in accordance with UL 1784.

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