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Fabric and Film Closures Used for Smoke and Fire Protection

Note: Although the scope of DASMA work does not currently include fabric and film closures, the members believe that a Technical Data Sheet is helpful toward clarifying where such products can be used with respect to rolling steel fire doors.)

In the marketplace, there are applications where a product other than a rolling steel fire door may be needed on a project where an opening requires a fire and smoke resistant product. This Technical Data Sheet will describe where fabric or film type closures may or may not be allowed by code, and some of the differences between them and rolling steel fire doors.

Stage/Audience Separation

Fire and smoke protective materials are often required to separate audiences from performance stages. Large, fire resistant fabric curtains have been used in these applications. These curtains are recognized in the International Building Code (IBC) as "proscenium curtains".

Most proscenium curtain designs are very different than rolling steel fire doors in that they do not coil, but rather fold, or are rigid frames covered with fabric. The curtain component is constructed with a tested fire resistant fabric, but the remaining components and rigging are not part of a tested, listed or labeled assembly.

Rolling steel fire doors are not typically used to separate audiences from stages.

Elevator Hoistways

Elevator hoistways tend to act like a flue or chimney in a fire. Despite being protected by rated fire doors, the openings can allow a great deal of hot smoke and products of combustion to infiltrate the hoistway shaft and rise, potentially spreading these gases throughout a multiple floor building. The IBC has traditionally required that an elevator lobby be constructed to seal hoistways on individual floors with swing doors activated under a fire condition. Alternatively, swing doors complying with smoke and

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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.

draft requirements are allowed at the hoistway openings in lieu of lobbies. In some cases, accordion type doors are allowed to seal the hoistways in lieu of lobby construction.

In more recent years, the IBC has allowed fabric or film closures for hoistway openings that meet UL1784 requirements and activate upon alarm to seal the openings, again eliminating the lobby requirement. These closures range from nylon type materials to woven, coated fiberglass materials. The intent of these closures is to seal the openings against smoke during alarm, allow for emergency personnel use during alarm, and to reseal the opening if opened during alarm for passage.

Rolling steel fire doors are not used in these applications, unless in a lobby that also includes swing doors providing required egress.

Interior Areas of Vertical Communication

In some cases, static curtains or other barriers are used around the perimeter of an opening in a vertical communication area to lower the smoke plume and prevent a direct path of smoke migration through the opening. In other cases, vertically deployed accordion or other type curtains may be used to isolate the opening from floor to ceiling with the intent of completely stopping the passage of gasses.

This perimeter-type application may necessitate the use of fabric closures since rolling steel fire doors may not be practical due to design constraints.

UL 10B (Fire Test of Door Assemblies) Tested Closures

Rolling steel fire doors are considered structural barriers in a fire condition and as such must be tested to UL 10B per the IBC. UL 10B requires that a closure pass a test period from 20 minutes to four hours and then be subjected to a continuous high pressure fire hose stream test for a specified period of time. The hose stream test is an impact type test to determine the integrity of the closure under severe stress, and there can be no visible openings in the test sample subsequent to the test.

In light of recent developments, there are fabric type products that meet UL 10B test requirements. However, standard fabric closures are typically not capable of withstanding this test and thus are not a viable choice for openings requiring structural separation. Rolling steel fire doors are the proper choice when structural separation is required, since they can be successfully tested to UL 10B or equivalent.

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UL 10D (Fire Test for Fire Protective Curtain Assemblies) Tested Closures

UL 10D testing is intended for fire protectives providing only supplemental, non-structural fire protection as part of an engineered fire system that includes other fire protection elements.

Fabric closures can be tested to this standard, but UL 10D does not include a hose stream test. Fabric closures are usually required to comply on an alternate materials and methods basis, as allowed by the IBC, to achieve specific design or performance goals.

Designers can be afforded flexibility in design by creating additional areas of compartmentation and combustion control through the use of these products, typically where use of rolling steel fire doors would not be practical. UL 10D testing is generally not applicable to rolling steel fire doors.

UL 1784 (Air Leakage Tests of Door Assemblies) Tested Closures

Any opening or space requiring smoke control or compartmentation beyond the requirements set forth by IBC may utilize a fabric or film closure tested to UL 1784. This is a pressurized test at ambient and elevated temperatures designed to prove the capacity of the closure's ability to limit the passage of smoke and hot gasses.

In many cases, fabric or film closures can be tested and listed to UL 1784. Rolling steel fire doors can also be successfully tested and listed to UL 1784. For any of these products, an "S" rating can be included in a product labeled for code compliance use.

NFPA 80 (Standard for Fire Doors and Other Opening Protectives) Compliance

Fabric fire curtains are now one of the products within the scope of the NFPA 80, which requires that they be tested in accordance with UL 10D but allows for testing to UL 10B or UL10C when acceptable to the Authority Having Jurisdiction. Not all fabric fire curtains may comply with those requirements.

Rolling steel fire doors are also within the scope of NFPA 80, where they must comply including undergoing successful testing to UL 10B or equivalent.

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Horizontal Closures

Horizontal closures can be used in atrium structures to separate the spaces into multiple floor zones. There is currently no test standard for horizontal closures; thus, projects would be required to comply with the IBC on an alternate materials and methods basis to achieve specific design goals of the building owner and architect.

Fabric or film closures may be needed in these cases where greater flexibility of materials is required for the application, typically where use of rolling steel fire doors would not be practical.

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