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Life Safety DIGEST

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High-Rise Combustible Construction

Code Developement 101
Using ICC's cdpACCESS™

Fire-Resistance-Rated & Smoke-Resistance-Rated Systems & Fire Code Maintenance Requirements

ANSI UL 1479, Part 3
Materials, Concrete Floors and Walls

Know When to Say When
Friends Don't Let Friends Overfill Sleeves

Firestop Contractors FCIA International Association

WRITTEN BY **JOHN ZALEPKA**

KNOW WHEN TO SAY WHEN

Friends Don't Let Friends Overfill Sleeves

When it comes to maintaining the compliance of fire-resistance-rated construction in any type of building post occupancy, one of the most difficult areas is the breaches in barriers caused by datacom cabling installations. The ever expanding information technology needs of healthcare facilities, banks/financial institution or educational buildings necessitate frequent cabling installation projects. Often times, within a few months of the new owner or tenant taking occupancy of the building, the cabling infrastructure is modified. This results in diminished code compliance as penetrations are made to accommodate new cabling and they are not always firestopped properly.

Cabling infrastructure modifications, sometimes referred to as MAC (Moves, Adds and Changes) in low voltage cabling vernacular, is the biggest challenge in maintaining code compliance of fire-resistance rated walls and floors, and, more importantly, the life-safety of a building.

While many of these applications could easily be remedied with a versatile Intumescent firestop caulk, the use of such a product can glue the cables together, thereby preventing future cable MACs.

As such, retrofittable, or re-enterable, sealing products such as non-hardening putties (see Image 1) that can be removed and reinstalled as necessary make sense.

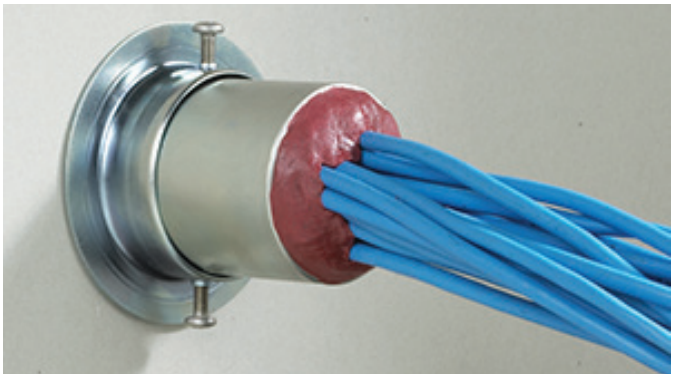

Figure 1, STI photo

Deployment of new technologies and the size and scope of the Local Area Network (LAN) are growing exponentially on a daily basis. There are a massive number of communications cables finding their way into concealed overhead and under-floor spaces of open-plan offices, healthcare facilities and educational institutions throughout the world. The MACs of low-voltage cabling is posing a significant burden to installed firestopping systems on a daily basis.

There are **2 key challenges** to maintaining code-compliant, firestopped sleeves that restore the ratings of the wall to what it was before a breach was made to accommodate the cables:

1. MAINTENANCE OF THE FIRESTOP SYSTEM
2. OVERFILLING THE SLEEVE WITH CABLES GREATER THAN THE FIRESTOP SYSTEM ALLOWS

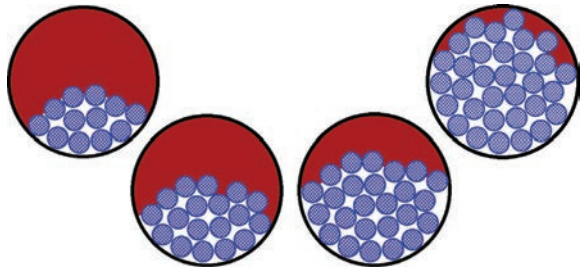

Figure 2 illustrates the typical life-cycle of low voltage cables installed in a traditional firestop sleeve where cables are added over time and firestopping is removed, eventually leaving the penetration with an excess of cables and an insufficient volume of firestop material to properly protect the opening. STI image

MAINTENANCE OF THE FIRESTOP SYSTEM

The first challenge can easily be solved with a little upfront planning. Some facilities can manage the risk by creating a Standard Operating Procedure (SOP) to mandate that a retrofittable firestopping solution is

used and replaced after any cable MAC work. While healthcare facilities are subject to increased scrutiny during surveys by state regulatory agencies or entities such as The Joint Commission, other occupancies are subject to local fire code inspections after the building goes into service. This means that over time, firestop systems may be compromised, or removed and not reinstalled properly according to code, thereby leaving a potentially devastating life-safety issue and the risk of a failed inspection.

Figure 3 illustrates a typical malleable firestop putty that should be kept on hand for retrofittable applications. STI photo

A SOP helps to establish guidelines and parameters for performing retrofit work in an existing building, including how to properly install a tested and listed ***UL® Firestop System*** and how to maintain that System opening on a continuing basis, along with specifications including products and sealing methods to be used. Implementing a barrier management program will also assist with the continued compliance requirements of the building. There are many examples of these programs available in both print and digital versions.

OVERFILLING THE SLEEVE

The biggest safety concern when firestopping a breach in a wall or floor with cable penetrations is allowing cables to totally displace the firestop materials and/or exceed the maximum allowable percentage of cable fill. The biggest question is always ***what is the maximum % of cable fill allowed in a sleeve?***

Contrary to popular belief, there is no code-mandated cable fill percentage for datacom cabling. Sometimes contractors will cite the National Electrical Code (NEC), but the NEC makes it quite clear that fill percentages relate only to electrical cables in conduit or cable tray and are not related to datacom cable. The limiting factor that restricts fill percentage for datacom cabling is defined within the UL Systems. Often time, contractors who install firestop systems talk about the 35-40% rule of thumb, believing that the National Electrical Code (NEC) calls out the maximum allowable cable fill in a sleeved opening. This is a common misconception that artificially restricts the cable fill of sleeved openings in fire-rated and non-fire-rated construction alike.

Firestop systems evaluated to the requirements of ASTM E814/UL 1479 list the maximum cable fill percentage in openings or sleeves passing through fire-rated construction, such as the 46% fill called out in ***UL® System*** No. WL3133: *aggregate cross-sectional area of cables in sleeve to be max 46 percent of the cross-sectional area of the sleeve. Cables to be tightly bundled.* Cramming that last cable into a tightly packed sleeve can push it beyond the cable fill percentage that the original firestop system was designed to accommodate, making the installation non-compliant to the firestop system design in UL 3133.

When sleeve fill percentages are exceeded, more robust and expensive solutions are required to remedy the situation, such as firestop collars. These remediation methods also make existing sleeves static and require a new sleeve or pathway to be installed to accommodate future work.

MINIMIZING NON-COMPLIANCE

In a more perfect world, all facilities would have well-defined SOPs along with regularly scheduled inspections to verify that installed firestopping systems are properly maintained. In fact, the International Fire Code (IFC) actually requires fire protection features such as firestop systems to be as such maintained. But is this always done?

When it comes to the burgeoning technology needs of today's business environment and the need to install more cabling, firestopping can unfortunately be relegated to an after-thought. Some best practices that can mitigate future problems include:

1. Labeling of fire-resistance-rated construction to clearly identify fire-ratings.
2. Labeling of individual sleeved cable openings to identify them as requiring firestopping and possibly even the recommendation of sealing only with retrofittable firestop products.
3. Hiring a specialty firestop contractor to help monitor barrier integrity and remediate any deficiencies.
4. Choose purpose-made cable pathway devices that provide a self-sealing function to eliminate guesswork and long-term maintenance.

The old adage "plan the work and work the plan" was never more appropriate. By planning ahead for cable MACs, a facility is better equipped to deal with them on an ongoing basis.

Using FCIA's philosophy, the proper **D**esign, **I**nstallation, **I**nspection, **M**aintenance and **M**anagement (DIIMM) of Firestop Systems will only help to reinforce ongoing code compliance and affording occupants with the proper level of safety.

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