



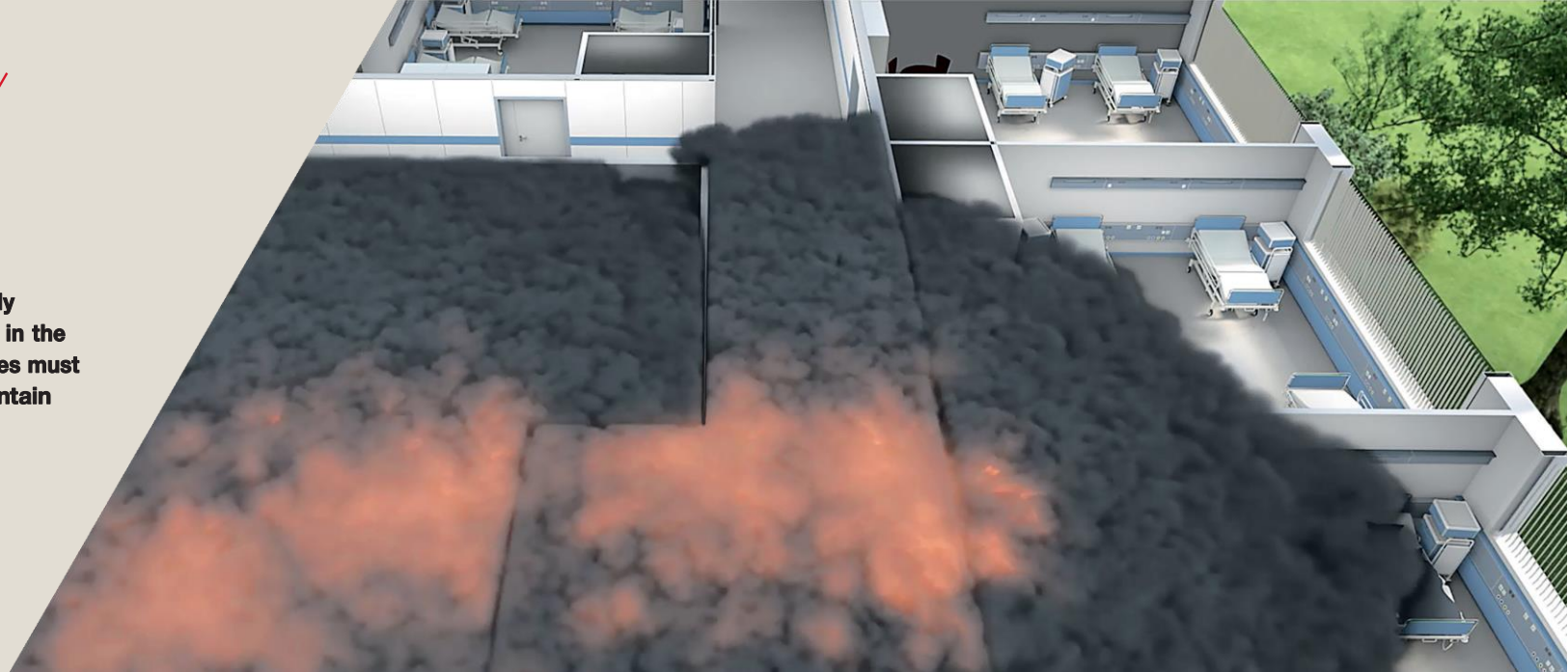
FIRESTOP IN HEALTHCARE

**Fire protection and airflow control to
help minimize risk in mission-critical
facilities**



CHALLENGING REQUIREMENTS

When it comes to fire safety, hospitals are uniquely challenging projects. On the one hand, variations in the mobility of occupants mean that evacuation times must be maximized. On the other, modern hospitals contain complex and ever-changing building services. This demands passive fire protection and compartmentation measures which help to meet the strictest regulations and can allow critical rooms to remain in full operation after a fire incident.

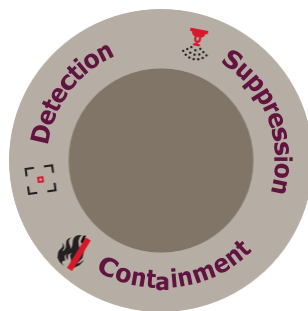


IMPORTANCE OF PASSIVE FIRE PROTECTION

With dynamic and complex requirements for building services, the number of penetrations passing through fire-rated walls and ceilings is typically high. Gaps in fire-rated walls and ceilings may represent a risk for patients, staff, and equipment, as fire – and more importantly smoke – can spread rapidly.

Active fire protection alone, including detection (e.g., alarms) and suppression (e.g., sprinklers), may not be enough.

Containment of fire and smoke is also key: effective compartmentation can be achieved with passive fire protection.



FIRE SAFETY AFTER A SEISMIC EVENT

Fire can be a common post-earthquake risk, as mechanical pipes and electrical cables can be damaged, releasing flammable contents or sparks. Hospitals are also critical in helping communities recover from earthquakes, so it's important that they don't experience significant damage or associated downtime.

Therefore, firestop products used for pipes, cables, and joints, should be tested under seismic conditions, and designed to withstand movement.

KEEPING OPERATING COSTS LOW

Healthcare is a sector under severe cost pressure with a duty to keep building life-cycle costs low. Hospitals are dynamic environments with constantly changing patient requirements and technological advancements. As new equipment is purchased and existing equipment is maintained or reconfigured, firestopping after every maintenance activity can be an uncalculated hidden cost.

On top of that, in critical rooms like intensive care units, the air pressure should remain stable. Therefore, the prevention of air leakage and every marginal efficiency gain can positively contribute to the reduction of the life-cycle cost of the building.

Firestop solutions that contribute to easier maintenance and airflow control can have a direct impact on your bottom line.

SENSITIVE SURROUNDING

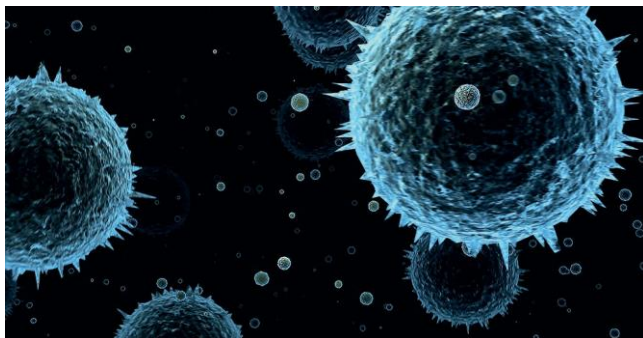
As well as the wide-ranging challenges of designing, building, and maintaining healthcare facilities, there are also other significant challenges in ongoing operations. When looking to contain the spread of fire and smoke, there are other important considerations – such as infection control, airborne fibers, and acoustics.



INFECTION CONTROL

Penetrations for services between patient rooms can represent a source of airborne bacteria transmission.

Therefore, airflow control must be carefully managed to help keep the air where it is intended to be and therefore reduce the spread of infection.



VIRTUALLY FIBER-FREE

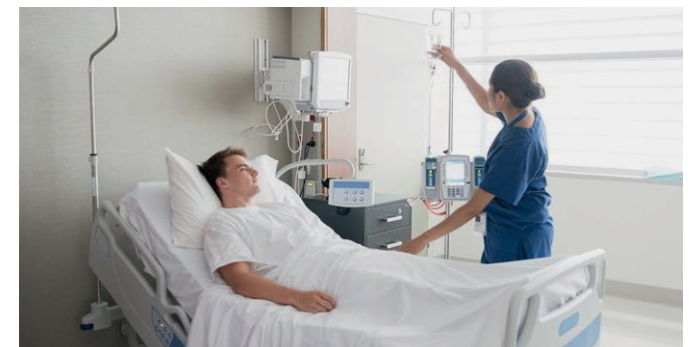
Commonly used traditional firestopping methods, like coated boards, are often composed of fibers of metallic ore and igneous rock. Whilst they can effectively prevent smoke and fire spreading, repenetrating these systems with pipes or cables may release fibers into the air, which could pose a risk to patients, particularly those in critical environments like operating theatres or intensive care units.



NOISE REDUCTION

Patient privacy, comfort and recuperation may be compromised when noise from adjacent spaces travels uninhibited. A main cause of these problems is the inadequate acoustic insulation between rooms.

Firestop products with superior acoustic insulation properties help contribute to the overall noise reduction.



SOLUTIONS FOR DEMANDING APPLICATIONS

Hilti has over 30 years of experience in providing internationally tested and approved firestop systems for a wide range of mechanical, electrical, and mixed penetrations applications.



MECHANICAL APPLICATIONS

Solutions for wastewater, fresh water, heating, and gas pipes:

- **CFS C-EL Firestop collar endless:** flexible and approved for a wide range of pipe configurations
- **CFS-B Firestop bandage:** versatile, quick and easy-to-install with no hooks, anchors, or drilling
- **CFS-C P Firestop collar:** easy-to-install, retrofit, and visually inspect



ELECTRICAL APPLICATIONS

Solutions for electrical cables, cable bundles and conduits:

- **CFS-D Firestop cable disc:** self-adhesive discs of firestop putty for small penetrations
- **CFS-PL Firestop plug:** ready to use, easy to install, maintain and retrofit
- **CFS-(R)CC Firestop cable collar:** solutions for renovation works in medium to large penetrations without removing existing firestop



LARGE OPENINGS

Solutions for mixed penetrations:

- **CFS-BL Firestop block:** pre-cured and ready to use for medium to large openings – no power tools required – making it easy to install, maintain and retrofit. Ideal for sensitive environments (ICU, OR) with strict dust requirements
- **CFS-F FX Firestop foam:** traditional firestopping method for small to medium openings and covering clima-split air-conditioning services



CODE COMPLIANT

Our products are designed to meet firestopping requirements of a wide range of international and national model codes and approvals, such as UL, ETA, etc.

Many firestop products come with additional benefits, including mold and mildew resistance, thermal or acoustic insulation. Many also meet stringent environmental requirements to support green building standards, such as LEED® and BREEAM®.

On top of that, many of our firestop products have been tested according to the newly developed ASTM E3037 standard, which measures the performance of the products under movement and seismic conditions.



INNOVATIVE PRODUCTS FOR EASY MAINTENANCE

Our extensively tested firestop products are quick and easy to install, designed to optimize construction time and help to reduce installation mistakes.

Their advanced design not only provides superior firestopping but also successfully addresses other pain points in a hospital environment, like airflow and noise control.



FIRESTOP SLEEVE

Preformed, ready-to-use solution with no need for drilling or sealants. Industry-leading airflow control and easy cable changes thanks to its advanced twist mechanism. This helps to improve infection and dust control as well as energy efficiency.

Plus, you don't need a firestop professional each time you move a cable, saving you time and money!



TOP TRACK SEAL

For interior gypsum-board walls using metal frame construction, this firestop solution fills the gap between the metal and concrete surfaces. This means CFS-TTS has a high air-tightness performance, contributing to the airflow control thanks to its innovative composition that prevents cracks and other imperfections.

The all-in-one design helps to improve jobsite productivity.



CAST-IN DEVICE

Firestop cast-in devices make life easier compared to traditional methods of shuttering or breaking/coring after the concrete is poured. A one-step solution that maintains the opening and firestops the pipes at the same time.

Once installed, the device has an integrated water and smoke seal which helps to impede water, as well as meeting high acoustic requirements.



"Hilti cast-in devices create the opening for the pipes to go through and at the same time offer an integrated firestopping system. This product is so efficient and easy to install. We have installed 5,000 pieces and we had zero failures."

Nikolaj Pedersen, Production Manager,
Engineering and Construction Services

MORE THAN JUST PRODUCTS

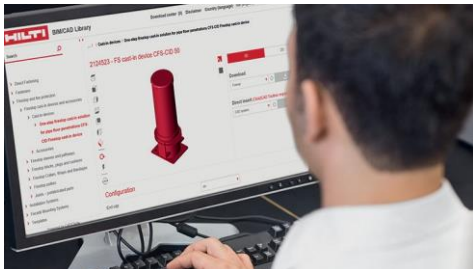
Our software tools and helpful services assist you throughout the whole life cycle of your healthcare facility – from design to construction and ongoing maintenance. This helps you and your team to choose the most relevant products, install them quickly and effectively, comply to model codes and help support a smooth inspection process and handover.



BIM/CAD LIBRARY

Hilti BIM/CAD library gives you access to Hilti products as 3D and 2D BIM/CAD objects. Simply integrate them directly into leading construction design software, such as AutoCAD® and Revit®.

More than just a library, it allows you to choose which country you want to design and work in, supporting global code compliance.



DOCUMENTATION MANAGER

Hilti Documentation Manager allows you to securely record, track, and report on every installed firestop system – regardless of manufacturer.

You can markup digital floorplans, pull inspection reports, and collaborate with team members from anywhere on any device.



ENGINEERING JUDGEMENTS

Hospitals can be highly bespoke buildings. Although our approvals cover a wide range of applications, there can be project-specific needs that are not approved by international guidelines.

In this case, our experts help by providing engineering judgements covering the most demanding firestop applications.



ON-SITE SUPPORT AND CONSULTATION

Highly skilled local engineers can be with you on site during the construction phase to work with your teams and your subcontractors. Our local teams can also assist with any design, training or support required during execution.

We can also arrange installer training and issue training completion certificates.



PROJECT REFERENCE

University Hospital in Aalborg, Denmark is the centerpiece of ambitious plans to centralize all existing regional healthcare facilities under one roof. The complex encompasses 581 beds, 32 operating rooms, 117 outpatient facilities, 27 daycare facilities and 29 imaging rooms spread across 150,000 m².



CHALLENGE

The Building Owner's main concern was to make sure that all firestop is installed correctly and was easy-to-maintain.

Futureproofing was also a key goal – the integrity of all firestops must be preserved despite routine cable retrofitting. On top of that, ongoing value engineering and schedule optimization demanded a user-friendly, high-productivity firestop proposal.

SOLUTION

It is never too early to start planning firestop, and this project is case-in-point. From the design phase, Hilti Project Engineers worked directly with Specifiers to develop a firestop solution tailored to not only meet the budget and schedule, but also the practicalities of the hospital once it is operational. The Building Owner's safety requirements could be met without compromising the project delivery time, cable management, airflow control and product approvals.

During the construction phase, a dedicated Hilti Project Team routinely visited the jobsite to provide installation guidance and support to the Contractor's team.

Any challenges could be tackled on-site, helping to avoid delays or overruns.

Over 5,000 CFS-CID Firestop cast-in devices and 10,000 CFS-SL Firestop speed sleeves make up the finished hospital's fire compartmentation plan. For pipe penetrations, the CFS-CID cast-in device was selected as it reduces construction time and cost overall, and virtually guarantees fully approved firestopping when installed correctly. For firestopping cables, speed sleeves were specified thanks to their airflow control and because they make replacing cables a quick and cost-effective task for Facility Managers.

“We’ve seen fires in hospitals spreading fast because nobody thought about fire safety. This is what we want to avoid.”

Kim Enevold, Design Engineer
Oluf Jørgensen, Consulting Engineers



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