

FIRESTOP IN HEALTHCARE

Fire protection and airflow control to help minimise 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 maximised. 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 firerated 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 SURROUNDINGS /

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 ELECTRICAL APPLICATIONS

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

- CP 611A Firestop intumescent sealant: approved for a variety of water and gas PE-X pipes
- CFS-C P Firestop collar: approved for pipes from 40mm to 200mm in diameter

Solutions for electrical cables, cable bundles and conduits:

- **CP 611A Firestop intumescent sealant:** approved for a wide range of electrical services through small openings
- **CFS-PL Firestop plug:** provides the fastest way of firestopping circular openings up to 202mm in diameter
- **CFS-F FX Firestop foam:** ideal for firestopping electrical services through medium or irregularly shaped holes
- **CFS-BL Firestop block:** designed for firestopping electrical services through large openings. Ideal for sensitive environments such as ICUs or operating rooms with strict dust requirements

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 optimise 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.



CAST-IN DEVICE

Firestop cast-in devices make life easier compared to traditional methods of breaking or coring after the concrete is poured. A onestep 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 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.



PROJECT MANAGEMENT FOR FIRE TESTING

Hospitals can be highly bespoke buildings. Although our approvals cover a wide range of applications, there can be project-specific needs that require additional testing.

In this case, our experts help by providing consultation and project management services for fire tests.

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.





PROJECT REFERENCE /

University Hospital in Aalborg, Denmark is the centerpiece of ambitious plans to centralise 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.

Future-proofing was also a key goal – the integrity of all firestop 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. could be tackled on-site, helping to avoid delays or overruns.

Over 5,000 Hilti firestop cast-in collars make up the finished hospital's fire compartmentation plan. The HIlti firestop cast-in collar was selected as it reduces construction time and cost overall, and virtually guarantees fully approved firestopping when installed correctly. "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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