



Fire dampers

What is the hazard?

If the dust extraction system has an air speed of 10 m/s or more then it is important that the extraction is shut down when the dampers are activated. This prevents the build-up of negative pressure in the ducts and will eliminate the risk that the ducts will implode or collapse.

All openings in walls, floors and ceilings have the potential to be weak spots in fire separations. Unprotected openings allow heat and smoke to spread through a fire separation into adjacent fire compartments. Heat may be conducted by metal parts (e.g. a ventilation duct) which could result in the ignition of combustibles located in the adjacent fire compartment.

How to reduce the risk?

Fire compartmentation provides an opportunity to limit a fire to a manageable size. However, it is typical that cables, pipes, conduits, ducts etc. are needed for the building installations or production equipment. To maintain an effective, fire separation every opening should be adequately protected.



Fire and smoke dampers, which are installed to prevent the spread of smoke within building systems, such as heating, ventilation and air-conditioning (HVAC) systems, are an integral part of fire compartmentation.

Dampers, which are activated electrically can be controlled from a central point and can be integrated into the safety control systems. This should ensure a relatively smoke free exit for the building's occupants as well as improve the safe entry possibilities of fire-fighters.

Installation

The fire resistance of the chosen solution should be equal to or higher than the fire resistance of the fire separation.

Fire and smoke resistant dampers, intumescent air transfer grilles and other similar equipment must be installed in accordance with manufacturer's instructions. However, such instructions must take into account the particular conditions at the site.

When designing the system, it is important to take into consideration, that both the fire dampers as well as the smoke dampers are accessible for both service and maintenance. If it is necessary to reach inside the duct (for example, to re-open a closed fire damper) then you must provide both a duct access door and a ceiling access panel or a ceiling which is of an accessible type.

Once a mechanical fire or smoke damper has been mounted, verification that the damper blade moves freely and does not stick at any point must be obtained.

The activation of the closure and automatic fan shutdown in HVAC systems should preferably be carried out with the aid of smoke detection. Fusible links should be avoided because they may not activate the shutdown in time. This is because the gas temperatures in HVAC ducts often remain below the activating temperature of the fusible link. If an older system has fusible links then those fusible links should be replaced by smoke detection.



An example of the incorrect installation of intumescent dampers.

Do not install any dampers in grease exhaust systems or clothes dryer exhaust systems. This is because there is the potential risk of the accumulation of grease and dust. Ideally, these ducts should be routed directly up and out of the buildings. If a hood or dryer exhaust duct passes through a separated fire section, then instead of installing a damper the duct can be encased in a rated enclosure, such as a fire-rated board or in a fire-wrap insulation material.

Inspection and maintenance

As with any building system, the inspection and maintenance of components is essential for ensuring that the system operates as intended.

Dampers must be regularly inspected by qualified personnel to ensure that they function as intended. The actual closing operation of mechanically operated dampers should be manually tested at regular intervals to ensure that they function properly. Each damper should be tested and inspected at the latest one year after installation. The frequency of subsequent tests should then be every year.

Modern systems with electrically activated dampers that are self-monitoring send an alarm to the building management system.

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