

Smoke and Heat Extractor Systems

In a fire, predominantly smoke, heat and hot gases are released during the combustion process. As a result of thermal lift these combustion materials rise towards the top of a room and form a layer of smoke and combustion gases under the ceiling.

This layer of smoke and gas becomes thicker with the continuing duration of the fire and within a very short time the whole room is filled. By means of rapid fire detection and sensitive triggering elements, the smoke and heat vents in the upper area of the room and, if necessary and appropriate, the secondary ventilation vents are opened automatically at very short notice. The rising combustion materials such as smoke, heat and combustion gases can escape directly to the outside through these vents, even as the fire is starting.



Image: Robert Tober

The necessary vents for the secondary ventilation system in the lower area provide the required compensation in the air stream and reinforce the thermal lift. The time of triggering of the opening process has a great influence on the optimal functioning of "natural smoke extraction". Based on current knowledge, the use of an automatic smoke detector is recommended. Every system is fitted with a manual trigger.

Objectives of smoke and heat vents according to TRVB S 125

- Smoke and heat ventilation systems have the task of removing smoke and heat in the case of a fire. They decrease the structural stress to a building that is caused by fire.
- Sufficiently large systems ensure that the layer of smoke and hot combustion gases in a fire are not excessive. In this way, escape routes can be kept free of smoke.
- Smoke and heat ventilation systems should hinder the spread of the fire and facilitate fire fighting.

Objectives of smoke and heat vents

- Securing escape routes
Protection and rescue of human life
People seeking to escape from the building can do so unaided, usually without the need of breathing apparatus
- Supporting units of the Fire Service
Pinpointing the fire
Rescue personnel have a longer period in which to evacuate the building
- Delaying the spread of fire
Making it more difficult for the hot smoke gases to ignite
- Protecting the environment
Minimising the use of extinguishing agents
Minimising extinguishing damage
- Property protection
Lessening of the thermal load
Maintaining the integrity of the building