

## X-FANS SMOKE EXHAUST SYSTEMS

*Infrarotsender und -sensoren an den Wänden der Abflughalle in Düsseldorf – in 5 m Höhe und einem Abstand weniger Meter – melden jeden Rauch sofort. Die Axialventilatoren gehen in Betrieb und saugen den Rauch deckennah aus dem Terminal ab.*

In complex buildings, such as departure halls, smouldering fires can easily have devastating effects if they are not immediately detected. Mechanical smoke exhaust systems can provide a higher level of safety than other systems. They create smoke-free layers along the escape and rescue routes and therefore allow people in the building to escape by themselves. Smoke exhaust fans remove smoke gases, thus preventing smoke from spreading uncontrollably and supporting the firefighters in extinguishing the fire.

Mechanical pressurised smoke exhaust systems remove not only smoke but also dissipate the heat, thus preventing a dangerous flash over. The required air transfer dampers open at the same time.

Requirements of a pressurisation system.

Keeping the layer with smoke gases separate from the smoke-free layer requires a delicate combination of supply and extract air; the following conditions must be met in particular:

- At the boundary between the smoke gas layer and the smoke-free layer, only minimal horizontal and vertical airflows at low velocities should be present, if at all.
- Supply air openings must be adequately sized and be installed at the right distance from each other. They must open automatically before the smoke exhaust fans are switched on.
- Supply air must be discharged into the smoke compartment considerably below the layer with smoke gas, ideally with no or very little impulse, and at a low velocity ( $< 3 \text{ m/s}$ ).
- The smoke exhaust openings should be at regular distances and ideally at the highest point.
- The smoke compartment must be limited with regard to the required smoke-free layer, the thermal capacity of the surrounding structure, and the fire capacity to be considered.
- The condition of the fans is to be inspected regularly. The integral X-FANS diagnosis system helps to detect any damages at an early stage and thus allows for condition-based maintenance.
- Keeping spaces free from smoke – pressurisation systems: Systems must be in place that keep escape and rescue routes, especially stairwells, free from smoke. The supply air must be discharged into the direction of the fire and away from the areas to be protected.

## X-FANS SMOKE EXHAUST FANS



are available for 200 °C, 300 °C, 400 °C and 600 °C.

The smoke exhaust fans have two operating modes:

- Permanent ventilation and smoke exhaust in the event of a fire
- Smoke exhaust only

There are four types of X-FANS smoke exhaust fans:

- Roof fans
- Axial fans
- Centrifugal fans
- Wall fans