Reliable Fire Detection for Elevators and Elevator Shafts

Elevators transport people throughout multi-level buildings — from high-rise offices and hotels to shopping centers and hospitals. They are critical to the efficient operation of every modern building and form an essential part of a life safety strategy.

By virtue of their design, elevator shafts are a critical component of building infrastructure. Like chimneys, they allow air and smoke to be transported rapidly across multiple floors, accelerated by the elevator movement inside. For these reasons, the elevator shaft is a critical consideration for fire protection and an evacuation strategy.

Some countries still require elevator shafts to be shut down in the event of a fire. However, a VESDA aspirating smoke detection (ASD) system from Xtralis provides very early warning fire detection to avoid a disaster. In addition to early warning, VESDA ASDs also enable remote detection because the sampling pipe network can be configured to avoid elevator operation disruption during normal maintenance. This flexibility avoids costly downtime.

For larger and more sophisticated buildings, elevators may be used as a primary evacuation route to complement the building stairwells. Again, early warning and reliable monitoring of smoke during the early stages of a fire are provided by VESDA for the safe evaluation of building occupants.

When managed correctly, the lift shaft can provide essential exhaust venting to prevent smoke from reaching other floors, thus avoiding the potential for panic and injuries during evacuation.

Fire Detection Challenges

- Difficult access for spot detector maintenance, testing and replacement
- Risk of heat and friction generating smoke
- Oil and greasing products
- Humidity and high temperatures causing corrosion
- Electric wiring and switchgear
- Minimum downtime
- Rapid air movement
- Hidden detection to avoid vandalism and improve aesthetics
- Risk of injury during spot detector maintenance

As elevator shafts cannot contain any other installations than those required for an elevator, the Dutch NEN2535 recommends aspirated smoke detectors where the detectors are placed outside the shaft.

Recommendation 21 of the Standards and Technology (NIST) World Trade Center report advises the installation of fire-protected and structurally hardened elevators to improve emergency responses in tall buildings and allow evacuation by all occupants.

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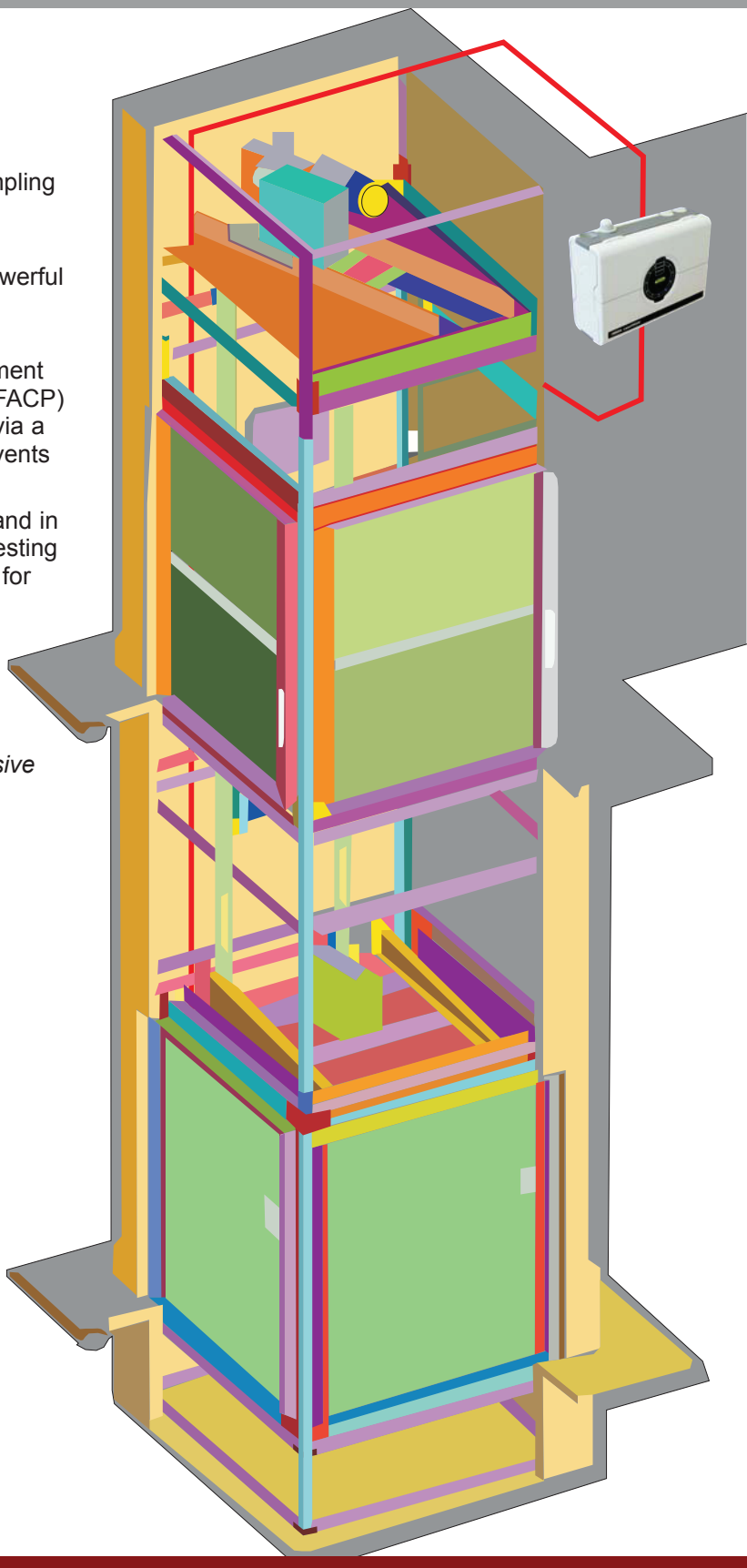
VESDA ASDs work by actively drawing air through sampling holes in a network of pipes that are installed along the elevator shaft and in the elevator machine room.

The sampling pipe is connected to a detector with a powerful aspirator that draws the air into a detection chamber to analyze it for the presence of smoke.

VESDA ASDs can be connected to a building management system (BMS) via an existing fire alarm control panel (FACP) or operate independently to provide alarm information via a relay output for local action, i.e., open or close smoke vents or alert a remote control station.

The VESDA ASD is placed outside the machine room and in shafts to ensure the detector is always accessible for testing and maintenance without the need to stop the elevator for access to the restricted area. The sampling holes are typically located at the top of the elevator shaft. In tall buildings, the pipe runs down the shaft vertically to ensure sampling at multiple levels.

Note: External filters can be used for areas with excessive dust and dirt. Please contact an Xtralis office for an engineered solution.



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Document: 18645_01

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