

## Firemac FM Fire Ducts: Case Study: AQ Towers, Doha, Qatar



AQ Towers

Doha

Qatar

The Abraj Quartier is the landmark component of a major mixed-use development in Doha known as “The Pearl”.

The two beacon-like office towers flank the main access road and serve as the gateway to the overall Pearl development. The Abraj Quartier will include 2,200 residential units and a total of more than 350,000 m<sup>2</sup> of built area.

Firemac FM Fire Ducts have been installed throughout the main towers including an eight level parking podium and forty three levels of high rise office space.

### AQ Tower: Performance Specifications of Firemac FM Fire Ducts

- Car park ventilation Ducts
- Ventilation / Smoke Outlet Ducts

### Fire resistance period

- 2 hours

### Basement and enclosed car park systems

Fire compartmentation is a passive fire protection strategy which limits the spread of fire throughout a building, ensuring a safe means of escape for its occupants. Compartmentation is achieved through the installation of escape corridors and stairwells, using fire resisting ductwork, walls, floors, ceilings, and doors.

There is widespread concern over the effect of modern car design on the ignition and growth in fires (e.g. increasing electrical power, greater use of insulation materials, plastic fuel tanks) and how these fires may spread to other vehicles parked nearby by thermal radiation, direct flame impingement or running fuel fires from a fuel spill or tank rupture. This was particularly relevant in fire strategy developed for the AQ Towers build as it contained an 8 storey, fully enclosed, car parking area.

In addition, sites in basements are some of the most challenging incidents faced by fire service personnel due to the heavy fire loading, heat, limited egress and communications difficulties. Fires in enclosed basements are believed to kill more firefighters worldwide than any other type of incident.

Emission of smoke and gases occurs even during the early, pre-flashover stages of a fire. The inhalation of smoke and toxic fumes is responsible for a high proportion of fire-related fatalities and injuries. Reduced visibility also hampers rescue services.

The fire safety strategy in the AQ Tower incorporated smoke control and smoke clearance systems as a key component (see box right for a description of the purpose of each system). These duct systems often operate as standard ventilation duct systems during regular operation in non-fire conditions. The relevant test method for any ductwork system to be used in smoke extract systems is BS476: Part 24: 1987 (ISO 6944:1985).

The purpose of fire resistant ductwork in enclosed car parks and basements are two fold:

### Smoke control

Systems designed to extract smoke during the early stages of a fire, when temperatures are around 250°C to 350°C.

### Smoke clearance

Systems designed to clear the building of smoke following the extinction of a fully-developed fire.