2.12. Smoke Venting System Using Mechanical Exhaust Fans

2.12.1. Smoke venting systems using mechanical exhaust fans shall comply with the relevant general requirements for smoke control systems as per **Section 2.5** and **Table 10.10.**

Table 10.10.: Smoke Venting Using Mechanical Exhaust Fans

ITEMS	REQUIREMENTS
1. MECHANICAL SMOKE EXHAUST FANS	i. Mechanical smoke exhaust fans shall be listed and approved by Civil Defence as per the test requirements of **Section 6.** ii. The mechanical smoke exhaust fans shall be dedicated smoke exhaust fans and electrically operated. iii. Hurricane type and Natural type smoke exhaust fans without electrical power shall not be acceptable for smoke exhaust purpose. iv. Smoke exhaust fans shall comply with **Table 10.1.** and shall be approved for effective operation at 400^0C for 2 hours.
2. DESIGN CRITERIA	i. The mechanical smoke exhaust fans shall be designed to achieve 6 air changes per hour in a single smoke zone of not more than 900 m^2, assuming a single smoke zone is active at any single point in time. ii. Smoke zone areas can vary if justified by an engineering analysis.
3. MAKE-UP AIR (REPLACEMENT AIR)	i. Make-up air shall not exceed an inlet velocity of 5 m/s. ii. Sufficient makeup air shall be available for the mechanical exhaust fans. iii. Makeup air shall be provided by either fans, openings to the outside leakage paths, or the combination thereof. iv. Where mechanical make-up air is supplied, the supply points for the makeup air shall be located beneath the smoke layer interface.
4. LOCATION AND SPACING	i. Smoke exhaust fans shall be located on the roof, where smoke plume and reservoir is available vertically above the fire loads.
5. SMOKE SCREENS	i. Listed and approved smoke curtains shall be provided to enhance the performance of the mechanical smoke exhaust fans. ii. Floor area exceeding 4000 m^2 shall be provided with smoke curtains or downstands to divide the ceiling space to accommodate a smoke reservoir. iii. All smoke curtains unless permanently fixed in position, shall be brought into the position automatically to provide adequate smoke-tightness and effective depth. iv. The effective depth in general is 20% of the total floor ceiling height of the space. v. A minimum headroom of 1800 mm shall be maintained on circulation and evacuation paths when smoke screens or curtains are activated. vi. Smoke screens shall be located strategically to channel and create smoke reservoir below the mechanical smoke exhaust fans.
6. ACTIVATION	i. The mechanical smoke exhaust fans shall be interfaced with cross zoned fire detection and sprinkler activation. ii. A delay of activation of the roof exhaust fans, justified by the engineering analysis shall be permitted. iii. The mechanical smoke exhaust fans shall also be operable manually with a manual overriding switch.