

2.2. Components of Smoke Control and HVAC Systems

2.2.1. Components involved in Smoke Control Systems and HVAC Systems shall comply with **Table 10.1.**

Table 10.1.: Components of Smoke Control and HVAC Systems

ITEMS	REQUIREMENTS
1. FANS	<ul style="list-style-type: none"> i. Smoke Exhaust and smoke extract fans shall be rated at and capable of operating effectively at 400°C for 2 hours. ii. Fresh air supply and pressurization fans need not be fire rated, provided they are installed on roof or to the exterior open environment. iii. Dual mode fans, serving as both the fresh air supply and /or extract purposes, shall be rated at and capable of operating effectively at 400°C for 2 hours.
2. OUTSIDE AIR AND AIR FILTERS	<ul style="list-style-type: none"> i. Exposed fan inlets shall be protected with metal screens to prevent the entry of paper, trash and foreign materials. ii. Outside air intakes shall be protected by screens of corrosion-resistant material not larger than 12.7 mm mesh. iii. Outside air intakes shall be located so that these shall not introduce fire or smoke into the building. iv. The outside air intakes shall be minimum 5 m away from air/smoke/exhaust discharge openings/grills. v. Electrostatic air cleaners shall be listed in accordance with ANSI/UL 867. vi. Air filters shall be rated either as Class 1 or Class 2 in accordance with ANSI/UL 900.
3. DUCTS	<p><u>1. HVAC DUCTS</u></p> <ul style="list-style-type: none"> i. Air ducts for HVAC systems shall be constructed of iron, steel, aluminum, copper, concrete, masonry. See Figure 10.1. for illustrations. ii. Class 0 or Class 1 rigid or flexible air ducts tested in accordance with ANSI/UL 181 listing shall be permitted to be used for ducts when air temperature in the ducts does not exceed 250°C or when used as vertical ducts serving not more than two adjacent stories in height. iii. Pipe and duct insulation and coverings, duct linings, vapor retarder facings, adhesives, fasteners, tapes and supplementary materials added to air ducts, plenums, panels, and duct silencers used in duct systems, shall have, in the form in which they are used, a maximum flame spread index of 25 without evidence of continued progressive combustion and a maximum smoke developed index of 50 when tested in accordance with ASTM E 84 or UL 723. See Section 6 for Duct test requirements. iv. Flammable, non-listed and non-approved insulation coverings and tapes shall not be installed. v. Pipe and duct insulation and coverings, duct linings and their adhesives, and tapes shall use the specimen preparation and mounting procedures of ASTM E 2231. See Figure 10.2. for illustrations. vi. Air connectors shall not pass through any wall, partition, or enclosure of a vertical shaft that is required to have a fire resistance rating of 1 hour or more. Air connectors shall not pass through floors. vii. A service opening shall be provided in air ducts adjacent to each fire damper, smoke damper and any duct smoke detectors that need access for installation, cleaning, maintenance, inspection, and testing. viii. Ventilation ducts should not pass through smokeproof enclosures or the firefighting lobby. ix. Where unavoidable, the part of the ventilation duct within the firefighting lift lobby shall be enclosed in construction with fire resistance rating at least equal to that of the elements of structure. See Figure 10.3. for illustrations. Such construction shall be in masonry. If other form of fire resisting construction is used, the fire damper shall be fitted where the duct penetrates the lobby enclosure. No air conditioning or ventilation ducts shall penetrate separating walls. See Figure 10.4.