

9 ● At what point should a fan be selected for operation, and why?

At its point of maximum efficiency because the cost of operation and the noise produced will be least.

10 ● In Fig. 3, a static pressure of 85 per cent of blocked tight pressure corresponds to three different volumes, namely 11 per cent, 30 per cent and 48 per cent of wide open volume. What will determine which volume the fan delivers?

The fan can operate only at the intersection of its pressure-volume curve and the system characteristic. The type of system, together with the specification of the volume at a certain static pressure, completely defines the system characteristic.

As illustrated in Fig. 5, a given system characteristic will intersect the fan curve in only one point.

If the 85 per cent value for static pressure is specified for the 48 per cent value of volume, it is at once obvious that the same system will not have the same resistance at any other volume.

Chapter 28

AIR DISTRIBUTION

Definitions, Grille Locations, Standards for Satisfactory Conditions, Factors Affecting Distribution for Cooling and Heating, Air Outlet Noises, Selection of Supply Outlets, Balancing System

CORRECT air distribution contributes as much or more to the success of a forced air heating, ventilating, cooling or air conditioning system as does any other single factor. Supplying the proper amount of air is one problem; properly distributing it from the point where it leaves the fan is another. The distribution problem may be further divided into: (a) distribution to the various spaces served by the system, (b) distribution in these spaces. This discussion is primarily limited to division (b), reference being made to the duct system only insofar as it affects the performance of the air distribution outlets.

Definitions

1. *Supply Opening*: Any opening through which air is delivered into a space which is being heated, or cooled, or humidified, or dehumidified, or ventilated.
2. *Exhaust Opening*: Any opening through which air is removed from a space which is being heated, or cooled, or humidified, or dehumidified, or ventilated.
3. *Outside Air Opening*: Any opening used as an entry for air from outdoors.
4. *Grille*: A covering for any opening and through which air passes.
5. *Damper*: A device used to vary the volume of air passing through a confined cross-section by varying the cross-sectional area.
6. *Multiple Louvre Damper*: A damper having a number of adjustable blades.
7. *Single Louvre Damper*: A damper having one adjustable blade.
8. *Face*: A grille with provision for attaching a damper.
9. *Register*: A face with a damper attached.
10. *Flange*: The portion (either integral or separate) of a grille, face, or register extending into the duct opening for the purpose of mounting.
11. *Frame*: The portion (either integral or separate) of a grille, face, or register extending around the duct opening for the purpose of mounting.
12. *Margin*: The margin of a grille, face, or register is one-half of the difference between the duct dimension and overall dimension measured either horizontally or vertically.
13. *Fret*: The member separating the openings of a grille, face, or register.
14. *Free Area*: The total minimum area of the openings in the grille, face, or register through which air can pass.
15. *Core Area*: The total plane area of the portion of a grille, face, or register bounded by a line tangent to the outer edges of the outer openings through which air can pass.
16. *Mean Area*: The total of the core and free areas divided by two.
17. *Duct Area*: The area of a cross-section of the duct based on the inside dimensions at the point where the grille, face or register is mounted.