vailing wind as in the case of the boxed-in fan, openings should be provided on all sides. Kitchens should be separately ventilated because of the fire hazard, and to prevent the spread of cooking odors.

The window fan may be located in a hall or an unused bedroom. Noise of operation is more of a problem with the window fan than with the attic type, although care should be taken to locate either type of fan so that occupants are not disturbed.

These fans range in capacity from 3,000 to 30,000 cfm. The window type usually does not exceed 8000 cfm, while the most generally used attic type ranges from 8000 to 16,000 cfm. Power consumption is under 50 watts an hour per 1000 cfm of rated output for the 8000 cfm fan and larger, while the watts input for smaller fans is greater than this figure. Improved results can be secured with the window fan by closing off parts of the house where ventilation is not desired.

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Chapter 33

AIR CLEANING DEVICES

Dust and Lint, Classification of Air Cleaning Media, Viscous Impingement Type Cleaners, Automatic Viscous Filters, Dry Air Filters, Electric Precipitators, Performance and Testing, Selection and Maintenance, Methods of Installation, Safety Requirements, Adsorption of Vapors

AN air cleaner is a device for removing solid matter from a stream of air. This solid matter includes fibrous material such as lint, hair, dust, fumes, smoke, cinders, etc. The character of these airborne solids varies with the locality, as wind direction and velocity, industrial activity, etc. Information on air pollution and purification will be found in Chapters 10 and 12 and air sterilization in Chapter 13. In general, air cleaners are installed in ventilating systems to remove the airborne dusts which tend to settle out in the still air of the ventilated space and become a nuisance. Such dust comes under the classification of temporary atmospheric impurities listed in Fig. 1, Chapter 10, and includes most of the pollens, house dust, and similar allergens which motivate attacks upon persons of allergic sensitivity [1].

The air filters classified as viscous impingement types are widely used in general ventilating systems and will usually justify their cost through a reduction in housekeeping costs in the ventilated space.

For industrial applications and in locations where the larger part of the atmospheric impurities are of fine particle size such as smoke and fumes, more effective dry filters and electric precipitators are proving economical. By use of combinations of filters advantage may be taken of specific characteristics of the various types of filters. In at least one industrial application the air is passed through a series of filters, consisting of a bank of viscous impingement filters followed by an electric precipitator, which in turn is followed by a dry type filter using wool felt as a filter medium and, for absorbing certain gases, an activated carbon filter. Installations of this type which have been in operation for several years have proved to be economical on the basis of a reduction in cost of maintenance of the electrical equipment housed in the ventilated space.

There is at the present time no recognized standard test guide or method for measuring the cleaning efficiency of an air filter and expressing the efficiency in terms of the economic value which would result from the use of the filter. Air filters are usually selected on the basis of experience or judgment guided by the results of various test procedures.

A description of various types of air cleaners available commercially will be found under air filters in the catalog section of THE GUIDE.

DUST AND LINT

Airborne solid matter from the viewpoint of air cleaning is considered as lint and dust. Some lint originates outdoors, as animal hair, vegetable fibers, etc., but much is generated within buildings by the wear and brushing of fabrics in the form of clothes, draperies, carpets, etc. Lint is comparatively easy to capture in an air filter because of its comparatively great length. So far as air filter performance and testing are concerned, lint is chiefly important because of its tendency to impede or stop the flow of air through the filter. In general, lint, if not captured, will accumulate in corners and under furniture in a building in areas of slight air motion