

mercial instruments available for this purpose. The percentage of dust removal for commercial air-cleaning devices should range between 80 and 98 per cent, and the minimum removal under such conditions should be specified and guaranteed by the manufacturer.

AIR CLEANER TESTING CODE

A Code for Testing Air Cleaning Devices is now being developed by the AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS and considerable research is being carried on at the University of Minnesota.

CHAPTER 9

UNIT HEATERS AND AIR-CONDITIONERS

Functions of Unit Heaters; Types; Entering and Delivery Air Temperatures; Ratings and Capacities; Arrangements of Heaters; Direction and Location of Discharge; Boiler Capacity; Automatic Control; Quietness of Operation; Connections; Direct Fired Units; Unit Air Conditioners; Cooling Units; Unit Ventilating Machines.

IN this chapter are described the various types of unit heating, air conditioning, cooling and ventilating systems.

UNIT HEATERS

The industrial unit heater is composed of a heating element enclosed by a casing in which a power driven fan or fans are mounted. The fans draw or force air over the heating surface, and discharge it in selected directions.

Unit heaters usually are placed directly within the room to be heated. Unit heaters have the inherent characteristic of delivering and distributing the air by mechanical impulse. In many buildings this feature results in exceedingly economical and successful heating.

Functions of Unit Heaters

Unit heaters are designed to:

1. Circulate the air in the building at a rapid rate.
2. Promote uniformity of temperature and quick heating-up.
3. Direct the heated air so as to accomplish the positive and rapid placing of the heat where it is effective.
4. Counteract excessive temperature against cool roofs or ceilings, a concomitant of most other types of heating.
5. Reduce the number of heat emitting units and simplify piping and installation.
6. Increase the capacity of the heating surface by passing the air over it at high velocity.
7. Provide a system by which room temperatures are readily controlled manually or by thermostats.

In addition to their prime function of heating buildings, unit heaters may be adapted to a number of industrial processes, such as drying, curing, etc., with which the use of heated air in rapid circulation with uniform distribution is of particular advantage. They may be used for moisture absorption, such as fog removal in dye-houses or for the prevention of condensation on ceilings or other cold surfaces of buildings in which process moisture is given off. When such conditions are severe, it is necessary that the heaters draw air from outside in enough volume to provide a rapid air change and that they operate in conjunction with