Class "E" equipment capable of attaining from 75 to 80 per cent on the Synthetic Air Chart.

(*a*) Mechanical air supply with gravity exhaust but without air cleaning device, humidifying apparatus, temperature or humidity control.

(*b*) Direct-indirect systems with either mechanical or gravity exhausts.

(*c*) Open window and other so-called natural systems of ventilation.

TABLE 1. RECOMMENDED PERCENTAGES OF VENTILATION PERFECTION BASED ON THE SYNTHETIC AIR CHART*

	Per Cent
Schools:	
Class Rooms	92
Manual Training Rooms	90
Domestic Science Rooms	90
Amphitheatres	90
Corridors	85
Churches	85
Hospitals:	
Wards	90
Operating Rooms	95
Other Rooms	90
Theatres:	
Auditorium	85
Dressing Rooms, etc	85
Dance, Lodge and Assembly Halls	85
Office Buildings:	
Offices in office buildings or other buildings where persons are continuously employed	90
Department Stores	88
Other Stores	88

Factory Buildings:

The percentage desirable for factory buildings will vary over a considerable range, depending upon the character of the work and the processes employed, modified to a considerable degree by the dust content of the air and the possibility of maintaining it free from objectionable dust and fumes. This will require careful study for each installation.

The following Table 2 is offered as a guide for proportioning ventilation on the basis of square feet of floor space and may be used for certain cases where it might be more applicable than the cubic feet per person basis on account of the number of occupants being unknown or subject to possible change, or more applicable than the air change basis where unusual ceiling heights occur.

TABLE 2. AIR REQUIRED FOR VENTILATION BASED ON SQUARE FEET OF FLOOR SPACE

Schools:	
Classrooms	2.0 cu. ft. per minute per square foot of floor area
Assembly rooms	1.5 cu. ft. per minute per square foot of floor area
Gymnasia	1.5 cu. ft. per minute per square foot of floor area

*See Chapter XXXIV for description and data on the use of the Synthetic Air Chart.

Picture Machine Booth	1.5 cu. ft. per minute per square foot of floor area
Dining-rooms	1.5 cu. ft. per minute per square foot of floor area
Kitchens	2.0 cu. ft. per minute per square foot of floor area
Corridors	0.5 cu. ft. per minute per square foot of floor area
Wardrobes and lockers	2.0 cu. ft. per minute per square foot of floor area
Toilet, Bath, Etc.	2.0 cu. ft. per minute per square foot of floor area
Theatres:	
Seating spaces	2.0 cu. ft. per minute per square foot of floor area
Toilets, etc.	2.0 cu. ft. per minute per square foot of floor area
Hotels:	
Assembly rooms	2.0 cu. ft. per minute per square foot of floor area
Dining-rooms	1.5 cu. ft. per minute per square foot of floor area
Kitchens	4.0 cu. ft. per minute per square foot of floor area
Hospitals:	
Wards	1.0 cu. ft. per minute per square foot of floor area
Dining-rooms	1.5 cu. ft. per minute per square foot of floor area
Toilets	2.0 cu. ft. per minute per square foot of floor area
Kitchens	4.0 cu. ft. per minute per square foot of floor area

Note.—See Chapter XXIII (Modern Standard of Ventilation, Etc.) and Chapter XXV (Air Conditioning and Cooling) for further data on the quantities of Air required for Ventilation.

UNIT SYSTEMS[3]

Unit systems consist of an individual unit incorporating all the apparatus necessary for providing, directing and controlling the necessary volume of air heated to the proper temperature for the purpose. Two types are in common use, one for public building work and the other for factory and industrial installations.

All unit heating and ventilating devices consist essentially of small fans connected closely with heat radiating surfaces. Steam or hot water usually is used for heating, and electric motors usually are used for power.

Public Building Work

A unit heating and ventilating machine intended for public building work consists usually of a small rectangular steel cabinet, enclosing the following essential parts:—

1. A fresh air inlet.
2. An air filter.
3. A motor and fan assembly.
4. A radiator or heating element.
5. A cold air or by-pass chamber.
6. Mixing chamber.
7. Air discharge outlet.
8. Fresh air and recirculating control damper.
9. A by-pass or temperature control damper.

Note.—Both the recirculating control damper and the by-pass damper can be manually operated, or the recirculating control damper may be pneumatically controlled *from some remote point. The by-pass* or temperature control damper can be automatically operated on room temperature by means of thermostatic motor in connection with the use of any pneumatic automatic temperature control system. (See also Chapter XVI.)

When the fresh air inlet damper is open the fresh air is drawn immediately from out of doors, having the dust and dirt removed by means of the air filters. From this point the air is driven by means of the motor

[3]Data on Unit Systems contributed by H. B. Hedges, New York, N. Y.; G. E. Otis, Moline, Ill., and A. J. Nesbitt, Philadelphia, Pa.