(3) Between 150 percent of minimum speed and 3 times minimum speed, the standard continuous horsepower rating with a temperature rise of 40 C will vary with the speed along a straight line connecting these two horsepower ratings. No further increase in horsepower is recognized above 3 times minimum speed.

(4) Below 150 percent of minimum speed the lower continuous horsepower rating (see preceding item 1) will apply with a temperature rise of 50 C.
Example: 20/25 hp, 400 to 1600 rpm. This motor may be rated 20 hp, 40 C at 600 rpm and 25 hp, 40 C from 1200 to 1600 rpm. Between 600 and 1200 rpm the rated horsepower increases directly with speed from 20 to 25 hp.

(5) Motors may also be rated 1 hour with temperature rise of 50 C with the higher horsepower rating (see preceding item 2) throughout the entire speed range.
Example: 20/25 hp, 400 to 1600 rpm. This motor may be rated 25 hp, 50 C 400/1600 rpm; 1 hour.

Mechanical Modifications

Vertical Mountings are available for such applications as pumps and agitators. This type of application may require a special umbrella-type hood to pretect against dripping liquids.

Flanged Mountings are available for use where motors are built in as part of machines. Motors may also be supplied with flush plate mountings, suitable for close coupled pump and similar applications.

CHAPTER 40

SOUND CONTROL

Acoustical Terminology; Apparatus for Measuring Sound; Approaches to the General Problem of Noise Control; Criteria for Noise Control; Kinds of Noise; Noise Generated by Fans, Grilles, and other Sources; Sound Attenuation in Ducts; Determination of Room Levels; Cross Transmission between Rooms and through Duct Walls; Controlling Vibration from Machine Mountings

THE NOISE created by heating, ventilating, and air conditioning equipment has become an important factor in modern building design. Related to this, and of equal importance, is the problem of the transmission of speech or music from one part of the building to another through ventilating and air conditioning ducts. The architect and the acoustical engineer cooperate to produce rooms that are satisfactory for speech, music, or other intended uses. The ventilation and acoustical engineers cooperate to ventilate and air condition these rooms to be physically comfortable without adding noise in excess of established requirements. This chapter is planned to supply part of the information needed to achieve adequate quietness in rooms that are ventilated and air conditioned through supply ducts. The quieting of unit heaters and coolers is assumed to be the job of the manufacturers and is not covered here. Remaining information on cost, availability, durability and ease of installation can come only through experience with practical installations.

ACOUSTICAL TERMINOLOGY[1]

Sound Power W is the power in watts produced by a source of sound. This power may be (a) the total power radiated by the source over its entire frequency range, (b) the power radiated in a limited frequency range, or (c) the power radiated in each of a series of contiguous frequency bands. The frequency range or frequency band should be clearly stated.

Sound Intensity I is the power radiated in a specified direction through unit area normal to this direction, *e.g.*, watts per square meter, watts per square foot, or watts per square centimeter.

Sound Pressure p is the root-mean-square incremental pressure produced when a sound wave passes through an otherwise undisturbed medium. The unit is the microbar (1 dyne per sq cm or 0.1 newton per sq m).

Frequency f is the rate of repetition of a periodic phenomenon. The frequency is the reciprocal of the period, or the time necessary for the phenomenon to repeat. The frequency f of a single tone sound wave is equal to the ratio of the speed of sound c to the wave-length λ of the tone. $f = c/\lambda$, or $c = f\lambda$. The unit is the cycle per second, or cps.

Octave Frequency Bands. The frequency range of a noise is frequently broken up into octave frequency bands where, in principle, the upper fre-