

all installations, because they operate during sleeping hours. Central units are available in sizes from 3,000 to 30,000 cfm, and window units in sizes up to 8,000 cfm.

Fans For Special Applications

Fans are used to handle many gases other than air at normal temperature. These range from heated air to many types of fumes, vapors, and industrial gases which may be corrosive, explosive, toxic, radioactive, or merely noxious.

For handling corrosive gases, fans should be constructed of a material suitable for the particular gas being handled, although at times it is economical to plan on replacing a unit of standard material at more frequent intervals. Explosive combinations usually dictate a non-sparking fan, in which either the entire fan, or only those parts which might strike together if not adjusted, is built of non-sparking materials. Noxious, toxic, radioactive, or pure or valuable gases call for special construction to prevent leakage. This usually consists of a welded gas-tight housing, using flanged inlet and outlet, and some form of shaft seal.

In most of these special applications, since it is desirable to keep all bearings, drives and motors outside the gas stream, centrifugal fans are usually used, in arrangements 1, 2, 4, or 8 (Fig. 9). The exception is in the case of fans handling explosive mixtures, where propeller or axial fans are permissible when built with explosion-proof motors and non-ferrous wheels.

Fans handling hot air or gas are generally of the centrifugal type and follow arrangements 1 or 8, so that bearings, drives, and motors are remote from the heat. If of double-inlet type, they have inlet boxes and long shafts to keep the bearings outside the stream. Propeller or axial types are rare when the temperature exceeds 150 F. With temperatures above 600 F, special heat-resistant materials may be required for the rotors. In addition, to a remote location, for the bearings, external cooling is frequently required, when the temperature exceeds 200 to 250 F. This is often obtained by use of air-cooled or water-cooled jackets. With anti-friction bearings, a head-radiating disc, or a small circulating impeller between the fan and the nearest bearing, is sometimes sufficient. Oil lubrication rather than grease lubrication is commonly recommended.

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