

Air Handling Systems

by Manufacturers Service Co., Inc.

SQUIRREL CAGE FANS?

Question: Can a fan/blower from a furnace be used in a dust collection system?

Answer: Your thought is very valid, but I would like to make a few points relative to fan units. The type of fan, which is located inside your furnace, is a forward curve or otherwise known as a squirrel cage. The tips of the blades are inclined in the direction of rotation. This is the most common type of centrifugal blower. Normally used in residential heating and air conditioning systems and “light duty” exhaust systems. These blowers are only capable of pressures up to approximately 1 ½” static pressure water gauge. Static pressure is pressure, which is exerted against, the walls of an air duct, that is created by friction and impact of air as it moves. The average static pressure of most small dust collection systems is 8” to 10”. In other words a furnace blower does not have enough strength to overcome the static pressure of a central dust collection system. Also, the blower is not designed to handle dust. The air moved by this type of blower is generally clean. Forward curve fans are fabricated of lightweight and low cost construction.

The type of fan generally used for dust collection systems is a radial blade centrifugal. It has straight blades, which are, to an extent, self-cleaning, making them suitable for various kinds of material handling systems. The wheels are of simple construction and have relatively narrow blades. Housing construction is heavy duty and normally welded. They can withstand the high speeds required to operate at higher static pressures (up to 12” water gauge).

Proper transport velocity is required to keep the material entrained in the air stream. Heavier Particle requires faster velocity. If the velocity is insufficient the material will drop out and settle. To put air speed into perspective, air in dust collection piping normally moves at a velocity of 4,000 feet per minute. Air in heating and air conditioning systems normally moves at a velocity of 1,000 feet per minute.