



*Low-pressure, low-speed axial fans can move massive amounts of air to help cool otherwise unventilated commercial building spaces. Also known as high-volume, low-speed fans, they are available in a range of sizes, and can be conveniently installed on the ceiling.*

## HOW IT WORKS

Axial fans draw air from the space and blow it forward in the direction of the fan axis. The diameter of large axial fans varies from about 8 feet to 24 feet. They can move more than 100,000 cfm while operating at speeds of 60–150 rpm. Through the resulting forced-air convection, they dissipate body heat by evaporative cooling. It is estimated that occupants can feel 5°F–10°F cooler in a building where these fans are installed than in a building where they are not. These large fans are also proven useful to reduce heating requirements because they destratify the air, circulating it to create a more even temperature.

## DID YOU KNOW?

More than 50 models of axial fans greater than 5 feet in diameter are Energy Star certified. Their efficiency is generally 100–400 cfm per watt of power input.

## APPLICATIONS

Typical applications for low-pressure, low-speed axial fans are:

- Warehouses
- Beachfront restaurants
- Manufacturing facilities
- Dairy farms
- Open food markets
- Churches
- Fitness centers

## BENEFITS

**Energy and cost savings.** Large axial fans accomplish adequate cooling needs without an air conditioner. They use about 80% less energy than an air conditioner. Lower energy usage means lower energy costs. It is also more cost effective upfront to install these fans than to install air conditioners.

**Employee comfort.** Unventilated commercial spaces can be notoriously hot, and in coastal areas the humidity can add more discomfort. The ventilation provided by a large axial fan can lower the effective temperature up to 10°F by moving air from ceiling to floor and from wall to wall. When employees feel more comfortable, they can be more productive at their jobs.

**Compact and convenient.** Despite being large fans, they are compact. They do not have any sophisticated components like compressors; the only parts are the blades, the motor, and the housing. They can be conveniently installed on low or high ceilings using a mounting device.

**Increased warmth in colder months.** In the winter season, air stratifies in a still room and warm air rises to the top. Large circulating fans ensure that indoor air mixes to a uniform temperature. Destratification ensures that heat is not lost through the roof and that there is comfortable warmth near floor level.

**Environmental benefits.** Because large axial fans do not use refrigerants, they do not release gases with high global-warming potential. Additionally, because they consume a low amount of energy, their corresponding carbon emissions are low.

## LIMITATIONS

**Fans, not air conditioners.** These fans do not remove heat from the space. Rather, they reduce heat through the movement of air. As such, they may still be insufficient to provide adequate comfort during high temperature and humidity.

**Noise.** Because large axial fans create high airflow, they are noisy. Some workers may feel discomfort or irritation from hearing the peculiar noise pattern of a fan all day in the workspace.

**Placement considerations.** Building owners and employers should consider occupant safety and optimal performance requirements before installing large fans. They should avoid placing large axial fans directly beneath light sources to minimize the appearance of light blinking. The ceiling structure must also support the fan's hanging weight and operational torque for safe operation.

**Fire safety considerations.** Due to the powerful downward stream of air that they produce, large fans have been known to obstruct sprinkler operation during fires by dispersing water flow, thereby reducing the amount of water reaching the fire. Placement away from sprinklers is advised.