

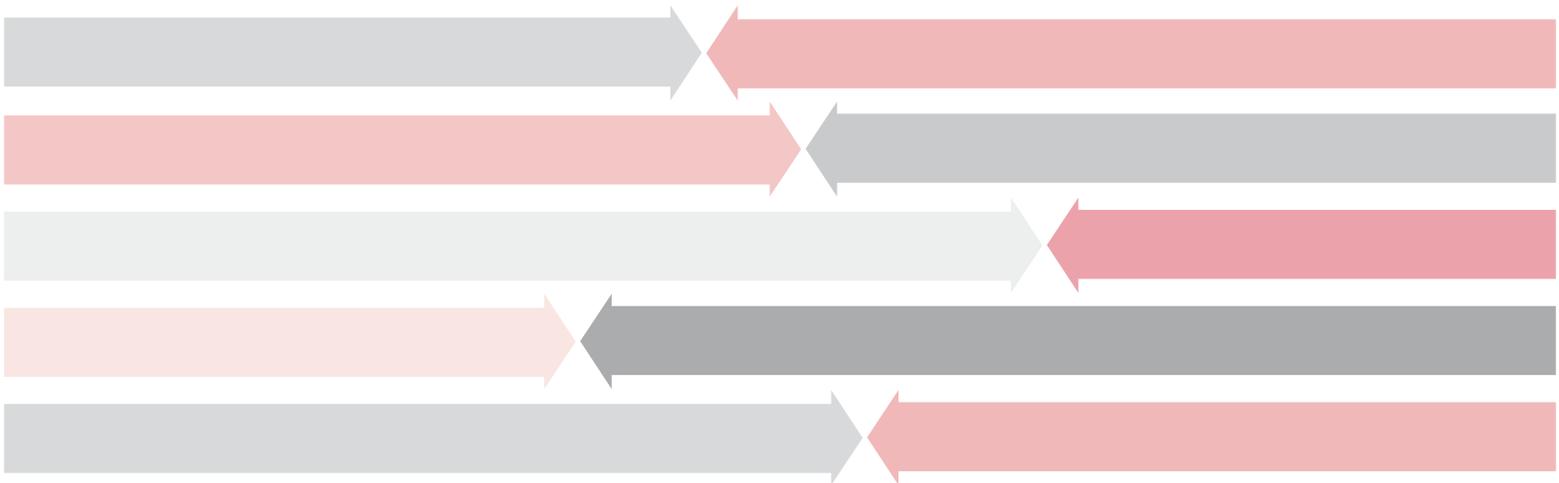


HVLS FANS:

Four important factors to consider prior to making a purchase decision

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**WHITE
PAPER**



HVLS fans improve airflow by drawing air down from the ceiling and across the floor. This helps to improve climate control and energy efficiency.



"...NOT ALL HVLS FANS ARE CREATED EQUAL."

THE NEW STANDARD

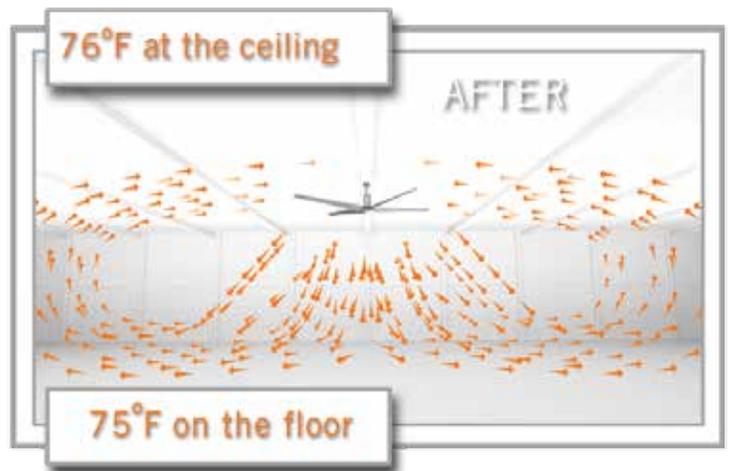
HIGH-VOLUME, LOW-SPEED (HVLS) FANS HAVE BECOME THE STANDARD FOR LOW-COST, HIGH-EFFICIENCY CLIMATE CONTROL IN A WIDE VARIETY OF COMMERCIAL AND INDUSTRIAL APPLICATIONS.

As the name suggests, HVLS fans move large volumes of air down from the ceiling and across the floor of a building. This controlled flow of air – from ceiling to floor – creates a more comfortable and productive work environment, while helping businesses control their energy costs. Improved air flow translates to improved temperature control throughout the year, which ultimately saves money.

A wide variety of businesses – from distribution centers and manufacturing facilities, to shopping malls and gyms – are choosing to install HVLS fans. HVLS fans are quickly replacing antiquated high-speed fans that are noisy, less-efficient and can take up valuable floor space. Businesses that are looking to integrate HVLS fans into their facilities should understand that not all HVLS fans are created equal. There are significant design and manufacturing variations that can impact everything from the quality of air movement, right down to the cost of operation and maintenance.

When researching HVLS fans, there are four key areas for consideration:

- 1. Blade Design**
- 2. Hub and Mounting System**
- 3. Safety**
- 4. On-site Consultation**



HVLS fans draw large volumes of air down from the ceiling and across the floor of a building. This helps create a more comfortable work environment while reducing energy costs.

1. BLADE DESIGN

The signature benefit of an HVLS fan is the production of air volume, which is created by a large diameter fan blade that can span up to 24 feet. A large fan diameter, however, is only part of the equation. Each blade must be capable of efficiently moving air or the result will be wasted energy. Fan blade design varies by manufacturer, so it is important to look for a design that produces uniform pressure and velocity from the hub to the tip of the blade. A lack of uniform pressure and/or velocity creates a number of issues, including backflow and increased energy consumption.



Rite-Hite fan blades have an advanced, contoured shape (tilt, taper and twist) that produces consistent airflow across the entire length of the blade.

To maximize performance, look for a tapered blade design that is narrow at the tip, where the blade velocity is higher, and widens toward the hub, where more blade area is required due to lower blade velocity. Also, it is important to look at the angle of the blade as it relates to the plane of rotation. The chord angle of the blade should be minimal at the tip and gradually increase as it gets closer to the hub.

The overall shape and design of a fan blade is what produces maximum air volume – **not the number of blades**. Certain HVLS fans struggle to produce consistent air movement because they are made from extruded aluminum. With extruded blades, the shape or blade angle is uniform from root to tip, or in other words, there is no blade twist. With this type of design, there is limited or no air movement directly underneath the fan center. This is a result of the blade tip moving most of the airflow and the blade root producing limited airflow. As a result, some manufacturers add blades to help compensate, which adds cost to the fan without increasing performance or value.

2. HUB AND MOUNTING SYSTEM



Rite-Hite fan blades are seated on the hub arm and locked into position with a machined bolt. In addition, the hubs and blades are rotationally-balanced and never require adjustment.

The design and construction of the fan blade is important; however, it's equally important to look at how the fan blade is mounted and the overall construction of the hub. A tight, solid connection between the blade and hub is critically important.

Similar to the blades of a helicopter, Rite-Hite's fan blades are attached to the hub by a pivot. The pivot is surrounded by a resilient, vibration-absorbing material, which eases the stress transferred to the hub and drive during operation. When compared to fans with rigidly-mounted blades, Rite-Hite blades can reduce stress to the hub and drive by upwards of 50 percent, which substantially increases the life of the drive mechanism.

A strong blade and hub design is extremely important, particularly in applications where multiple HVLS fans will be used or when HVLS fans will be used with other HVAC equipment. Competing air currents can damage weaker fans that are unable to absorb the forces created by lift and pressure.

To ensure a tight connection, Rite-Hite fan blades are mounted in two specific ways. They are seated on the hub arm and then locked into position with a machined bolt that requires a torque setting. In addition, all Rite-Hite hubs and blades are “rotationally-balanced” at the factory and will never require adjustment. This ensures smooth and balanced operation over the lifetime of the fan.

Improved air flow translates to improved temperature control throughout the year, which ultimately saves money.

Most HVLS fan manufacturers use a cast hub, which is created by pouring molten aluminum into a mold. It is difficult to regulate the consistency of a casting due to variances in the materials and manufacturing process. As a result, cast hubs are more porous and susceptible to cracking. Rite-Hite uses a milled aluminum hub that is much stronger than a traditional cast hub. A computer-controlled milling machine is used to remove materials from a block of aluminum. This process produces a more durable and reliable hub when compared to a cast hub.

3. SAFETY

Safety is always an important consideration when purchasing a piece of industrial equipment. Businesses should look for HVLS fans that offer a three-way motor-to-hub safety connection. First, look for a hub that attaches to the motor using a reverse thread bolt and tapered aluminum bushing. Second, look for a safety ring that backs up the motor to hub connection. And finally, each blade arm should be attached to the safety ring. These three features, working together, help to ensure the safety of people underneath and around the fan.

4. ON-SITE CONSULTATION

Prior to purchasing HVLS fans, companies should talk with a professional who can analyze a specific application. A consultant will look at things such as building size and operation; the amount of open and confined spaces within a facility; existing HVAC systems and more. The goal is to match the right size fan and desired air speed to a specific floor plan. Rite-Hite offers a wide variety of HVLS fans and can recommend a solution that is best suited for a specific application.

To schedule an onsite analysis by an HVLS professional, call Rite-Hite at [888-841-4283](tel:888-841-4283) or visit www.ritehite.com to learn more.

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ALWAYS LOOKING AHEAD



HVLS fans are often found in industrial settings like distribution centers and manufacturing facilities, however, they are becoming more common place in athletic facilities, amphitheaters, malls and other environments where air movement is critical.