

Industrial Vacuum Cleaners: A Breath Of Fresh Air

In developing a comprehensive and effective cleaning program, pharmaceutical plants should understand the importance of choosing the correct vacuum for their specific application.

by Paul Miller

From research and development to packaging, every sector of the pharmaceutical industry faces a common enemy — contamination. It can destroy the reputation of a product or a whole company, and even infringe on the safety of your workforce, all of which can cost millions. As if FDA regulations or international quality standards to protect consumers weren't enough, many pharmaceutical companies now have the Occupational Health and Safety Administration (OSHA) at their doorsteps to see if their facility is at risk for a combustible dust explosion, making contamination control much more than just housekeeping.

Contamination reflects the presence of a foreign substance that can undermine or have a detrimental impact on your product. Relating mostly to particulate matter, contamination can occur during production and falls into three categories:

- **airborne contamination:** carried/moved by air currents
- **fluid contamination:** generated or dispersed by fluids, whether in machinery or elsewhere
- **transfer contamination:** picked up (often by personnel and wheels of trolleys) and carried to critical areas.



Vacuums represent a critical component in helping to minimize or avoid certain risks in most manufacturing facilities.

What To Look For In A Vacuum

When selecting an industrial vacuum cleaner for your facility, there are many options. From basic vacuums with a collection container and motor, to those that feature almost too many gadgets, it's easy to lose sight of what's important.

Intermittent Vs. Continuous Duty

Deciding between intermittent and continuous duty vacuums is dependent on the requirements of your specific application and electrical requirements. If your application requires constant extraction, continuous duty is the best option. Continuous three-phase power is also more economical; however, not every plant is equipped with it. Single-phase power is more prevalent, but can limit the power of the vacuum. If the vacuum will be used for general cleanup of work

areas for approximately an hour or less each day, an intermittent/single-phase industrial vacuum is your best bet.

Portable vs. Central System

Because of their bigger size and increased suction power, central systems are capable of handling several applications at one time, including local exhaust ventilation and the pickup of fine powders. Central systems can also be isolated outside or in a separate room to control noise, and they can be used with accessories. Each system has its pros and cons, but for many manufacturers the decision between central and portable systems again comes down to the application. If very specific areas, such as multiple neighboring cleanrooms require cleaning, a central system with a drop down hose in each work area may be best. If flexibility is needed, say to clean the entire plant — including stairwells, corners, and overhead areas — then a portable system is most efficient. Many manufacturers utilize both a central system and a portable industrial vacuum to meet all their maintenance challenges.

Cleanroom:

Vacuums used in cleanroom environments require a high efficiency particulate air (HEPA) or ultra low particulate air (ULPA) filter, but the location of the filter is as critical as the type of filter used. Because contamination standards in pharmaceutical industries are stringent, HEPA/ULPA filters before and after the motor help achieve optimal efficiency. Placed 'downstream' or after the motor, the filter eliminates dust created by the motor from being released back into the cleanroom environment. An 'upstream,' before the motor filter, protects the motor from the debris being collected. An upstream filter will help prolong the life of the motor and also safeguard employees when maintenance is needed.

Aside from filtration, a simple, smooth construction is important for a cleanroom vacuum as it prevents contamination and is easier to clean. Nonporous stainless steel is preferred and is fast and simple to sanitize and validate.

Wet Or Dry:

Take spill response into account when purchasing a vacu-



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Tutorial

um. If you try to collect liquid with your dry-only vacuum you can easily ruin your investment and possibly even cause serious injuries. Wet-collection vacuums must have a grounded, by-pass motor to avoid electrical hazards. A stainless steel or polyethylene tank to prevent corrosion is a good feature to look for, along with an automatic shut-off valve to prevent overfilling.

Redundancy Is Important

No matter what type of vacuum chosen, superior filtration is key; and is what sets apart a quality vacuum from one that ends up in the trash. For peak operating efficiency, a vacuum should have a multistage, graduated filtration system, which uses a series of progressively finer filters to trap and retain particles. Since HEPA and ULPA filters have become standard in the pharmaceutical industry, a multistage system is key in protecting these filters from blockage and excessive wear and tear. A vacuum's filtration system should also use oversized filters, which slows airflow to optimize the air-to-cloth ratio.

It's Electric

In response to the newfound awareness of combustible dust, OSHA has called for the use of industrial vacuums to keep hazardous dust accumulations below 1/32" — but choosing the wrong vacuum can actually add to the risk. If the area you're cleaning is considered a classed environment, then a certified explosion-proof vacuum is required. This means that everything from the outer shell to the internal mechanics should be grounded and constructed of nonsparking materials such as stainless steel. Approval by a nationally recognized testing laboratory provides legal certification to ensure that every component in the vacuum meets strict standards for preventing shock and fire hazards and is suitable for your specific environment.

Conclusion

Like all investments, research is key. Visit manufacturers' websites and talk to sales reps; a company that is knowledgeable will certainly put your mind at ease. Look for a company that will be there after the bill is paid. Excellent post-sale support makes it easier when it's time to purchase replacement parts or service your industrial vacuum.

Under the burden of heavy regulations, manufacturers must continuously evaluate their housekeeping regimens to ensure that all controlled areas are properly cleaned and maintained. A solid maintenance plan is critical, and investing in a quality industrial vacuum should be viewed as more than just a cleaning solution. Purchasing the right vacuum can save money, protect the integrity of the product, increase productivity, and most importantly, safeguard the health of your workforce.



Paul Miller is vice president and general manager of Nilfisk Industrial Vacuums. Miller has more than 20 years of experience in the industrial vacuum cleaner industry, serving in various capacities throughout his tenure with the company. As a former sales representative, product manager, and director of operations, Miller has seen firsthand the unique maintenance challenges manufacturers face, developing effective and efficient solutions for their dust and debris problems.