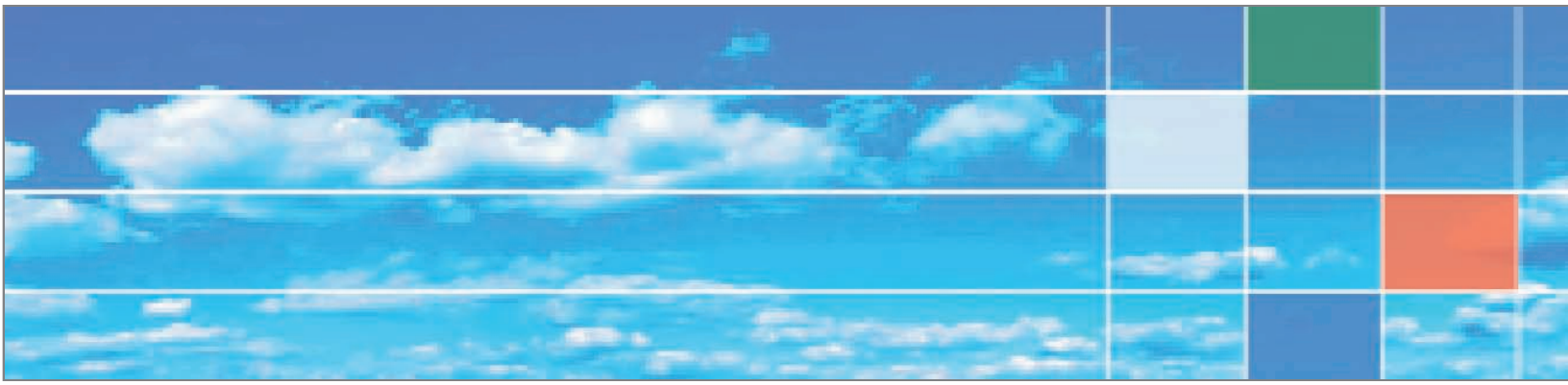
Survey Says:
Clean for Safety and Profitability



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In recent years, an increased focus on safety and security has permeated almost every industry in the United States, as well as abroad. Environmental concerns, economic competitiveness and technology have converged, causing industry and government to re-evaluate operating and manufacturing processes.

A specific issue for consideration is the increased emphasis placed on providing environmentally safe and more cost-effective ways of cleaning industrial plants, facilities and related equipment.

Food manufacturing and processing companies face particular challenges, as they generate an array of products which intrinsically present potential health challenges or hazards to their consumer markets. Plant and sanitation managers in these extended industries face unique contamination and waste removal issues and must consider multiple regulatory requirements related to hazards analysis and critical control points (HACCP), pest control, and equipment sanitation. This is in addition to standard manufacturing and operating issues such as worker safety, product integrity and quality control.

"Today food facilities face new challenges to employ environmentally safe and cost-effective ways to clean industrial facilities and equipment."

This heightened focus on food safety has been reflected in a number of recent surveys evaluating the current standards across the food industry. These surveys have in turn contributed to the development of best manufacturing practices.

Undertaken by private and public sector organizations, such as the FDA, these surveys are sometimes limited in scope, but combine to reveal consistent findings regarding food safety practices in many segments of the extended industry. For example, one indication is that small manufacturers are less likely to have certain food safety practices in place, particularly HACCP plans, than larger manufacturers.

Another important finding is that a majority of responding companies stated that they planned to improve pest control and that they have augmented or will be augmenting sanitation equipment.

The importance of employee training as it relates to product and worker safety also appears to be a common theme in many of these survey results. These surveys point to a clear recognition in food-related industries that the challenges of thorough and cost-effective cleaning processes are many and that failing to implement a comprehensive cleaning program can disrupt production, compromise product and worker safety, and waste time and money.

Quality and Cost Controls

More stringent quality standards and environmental/ safety regulations as well as new process and chemical technology have changed industrial cleaning from a "wet and wipe" application to an integral component of strategic facilities management. Traditional cleaning methods – solvents, sand blasting and manual sweeping or brushing – continue to have a place in today's food industries. But as occupational health and industrial hygiene professionals need to maintain increasingly higher standards while attempting to control costs, they are also looking closely at the efficiency and cost-effectiveness of all of the elements of their cleaning programs.

There are obvious costs associated with a comprehensive cleaning maintenance program, comprised of labor, equipment and consumable products, with labor typically representing the largest component. Hidden costs that are difficult to quantify, such as replacing inferior cleaning equipment, utilizing improper procedures, and failing to recognize safety concerns, also affect the bottom line.

Food manufacturers need to maximize efficiencies and control issues where they can by choosing better quality equipment, developing proper procedures and investing in employee education and training. Through these interrelated actions, companies will benefit by increasing the productivity and profitability of their operations.

Start with the Equipment

Industrial vacuums come in a broad range of varieties for the specific needs of diverse industries. From portable, intermittent-duty vacuums for general cleaning to

continuous-duty vacuums for process-integrated applications to central vacuum systems, industrial vacuum cleaners are now increasingly viewed as capital equipment. Today's task-specific industrial vacuums can be quite sophisticated, far removed from the generic "shop vac" found in the local building supply store or big-box retailer. Yet a surprising number of industrial companies still run down the street to buy these basic wet/dry canisters. Even when used for ordinary light-duty housekeeping functions, these vacuums can be expensive to operate, noisy, inefficient, and usually are very short-lived. Some companies replace several vacuums every year, making their low-priced solution far less cost-effective than they think. Cleaning system choices range from small air-powered (pneumatic) or electric-powered canister units to large, high-voltage electric or central vac systems. Some systems allow for multiple users vacuuming at the same time.

"Manufacturers...can save thousands of hours of downtime each year using task-specific vacuums instead of outmoded manual cleaning methods."

Cleaning with both a HEPA-filtered vacuum and traditional wipe-down methods are standard in a quality cleaning program. Yet vacuuming is often the most efficient method because particles are retained inside the machine with little chance of being exhausted into the atmosphere (provided the vacuum has a HEPA-filtered exhaust stream). Vacuuming also eliminates the fiber particles swabs and wipers may leave behind.

Managers of factories and production facilities should strive to keep every square inch of work areas as clean as possible. Surfaces to be considered include ceiling panels, lighting units, HEPA filtration units, sprinkler heads, walls, glass surfaces, process equipment, and piping systems. Floors and manufacturing equipment should all be decontaminated regularly.

Even the ambient air must be monitored and maintained at proper levels. HEPA-filtered ventilation systems assisted by preventive measures help manufacturers limit airborne contamination.

Protecting the most valuable asset

Although workplace blasts are not new, manufacturers have certainly seen more in the last few years. The food industry is particularly at risk for such explosions, working with combustible materials like, sugar, coffee dust and cornstarch. Under heavy pressure from legislators, the Occupational Safety & Health Administration has stepped in, issuing random audits and heavy fines for those companies failing to instill preventative procedures. And should a facility fall victim to a combustible dust-induced explosion, the loss can result in more than just dollar signs.

For facilities processing combustible material (as outlined in NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids), a certified explosion-proof vacuum can make the difference between life or death. For ultimate protection, an explosion-proof vacuum should be explosion-proof to the core. This means that everything from the outer shell to the internal mechanics including the motor, switches, filters and inner chambers should be grounded and constructed of non-sparking materials such as stainless steel.

Approval by a nationally recognized testing agency such as the Canadian Standards Association is imperative and will clearly define if a particular vacuum model is certified for use in your specific NFPA classified environment. It also provides legal certification and ensures that every component in the vacuum from the ground up meets strict standards for preventing shock and fire hazards.

Size Matters

To safeguard a food processing facility against the multiple sources of contamination, particle size must be taken into account. For critical vacuum cleaner applications, users should employ a machine that is HEPA-filtered to ensure that 99.97% of all particles down to and including 0.3 microns are collected and retained. For even smaller particulates, an ULPA (ultra-low penetration air) -filtered model is necessary to collect and retain particles down to 0.12 microns. In addition, it is absolutely critical that the HEPA filter be installed after the motor in order for it to properly filter the exhaust stream. The motor's commutator

and carbon brushes generate dust, and if the exhaust stream is not filtered, that dust will simply be released back into the environment.

However, not all HEPA-filtration systems are created equal. For peak operating efficiency, a vacuum should have a multi-stage, graduated filtration system, which uses a series of progressively finer filters to trap and retain particles as they move through the vacuum.

This multi-stage system protects the HEPA filters from blockage and excessive wear and tear, maintaining peak performance.

Ideally, a vacuum's filtration system should use oversized filters, which slow airflow action across the larger surface areas and optimize the air-to-cloth ratio. This allows the vacuum to easily collect large volumes of debris over extended periods of time – while once again minimizing maintenance.

The Basics of Vacuum Filtration

There are four primary factors that affect filtration: particle size, air speed, filter media and running time.

• Particle size – The smaller the particle, the more difficult it is to filter. As particles become airborne, they align themselves with the flow of the air stream, making it easier to penetrate filter media that is too porous. It is this factor that makes a series of graduated filters a critical vacuum component; even tiny particles that make it through the first few layers of filtration will be stopped by the finest filters, ultimately the HEPA or ULPA.

• Air speed – Velocity, or air speed, refers to the pace at which particles move through the hose and into the vacuum cleaner. The faster the particles travel, the deeper they will penetrate into the filter media. A particle traveling at a high speed may build up enough force to go through the pores of the filter material; however, a particle traveling at a slower speed will be caught on or between the fibers (or weave) of the media. A HEPA-filtered vacuum cleaner with a cyclone or paper-bag filtration stage slows the air down as it enters the machine, preventing particles from gathering too much velocity and enabling the other filters to operate at peak efficiency.

• Filter media – Filtering efficiency is affected by the relationship between the surface area of the filter media and the volume of air trying to pass through it. This relationship is known as the "air-to-cloth" (ATC) ratio; the lower the ATC ratio, the more efficient the filtration system. The ATC ratio is largely determined by the size of the filter; the larger the filter area, the more efficiently the vacuum can filter debris because there is a larger space in which to trap particles, and less frequent filter clogging. Therefore, the optimum ATC condition is a slow airflow through a large filter.

• Running time – As the vacuum operates, debris will build up on the surface of a filter and embed itself into the filter material, clogging the filter (also known as "blinding" or "loading"). A certain amount of loading is good for the filter; it improves efficiency by making it harder for the particles to penetrate the filter. However, when the filter becomes completely clogged, vacuum suction is reduced and performance suffers. Filters with a low ATC ratio, i.e., with a larger surface area, can operate for longer periods of time without clogging, enabling workers to maintain maximum suction and vacuum performance.

Conclusion

The reality of labor costs cannot be ignored when evaluating the cost-effectiveness of a comprehensive cleaning program. In terms of training, productivity, and vulnerability to safety concerns, employees represent the dominant factor, so the cost savings to be realized through maximizing labor efficiencies is critical. By choosing superior equipment and implementing clear, consistent practices, employees will be more productive and operations will be more profitable.

The bottom line is the bottom line. Proactively addressing the operational challenges in today's fast-paced global economy will save companies money in the long run. The selection of a high-efficiency industrial vacuum that has the filtration capabilities to preserve the integrity of the product and protect the health and safety of personnel is an important first step.

Making the Switch to a HEPA-Filtered Vacuum

When planning to purchase an industrial vacuum cleaner (or multiple cleaners) to maintain a facility, there are several important considerations:

Lift vs. airflow – It is necessary to evaluate whether lift (which determines suction power) or airflow (which determines the surface area and quantity of materials you can collect) is more important to your application. Generally it is best to strike a balance between the two to achieve peak performance, measured in air wattage. But in some cases, you may need to sacrifice one for the other. For example, if you're collecting heavy debris, you will need the highest level of lift possible. If you're collecting a large quantity of fine or light material, maximum airflow is key.

Long-term durability – The vacuum you select must be durable and rugged enough to survive daily use in a plant environment, but the durability of the HEPA filter must also be taken into consideration. Although most HEPA filters test well when first manufactured, poorly designed HEPA filters decline in performance – sometimes quite dramatically – over time. Heavy-debris producing applications typically require HEPA filter changes once a year to maintain peak performance. Less intense tasks will require less frequent changes. Make sure you select a superior-quality HEPA filter from an established supplier.

Central vs. portable system – Each system has its pros and cons, but for many manufacturers the decision between central and portable systems comes down to what areas of the plant they need to clean. If you need to clean very specific areas, a central system is best; if you need the flexibility to clean the entire plant – including stairwells, corners and overhead areas – then a portable system is most efficient.

Intermittent vs. continuous duty – Deciding between intermittent- and continuous-duty vacuums is mostly dependent on the requirements of your specific application. Certain applications, like woodworking, benefit from process-integrated, continuous-duty systems. These units feature suction outlets attached directly to the manufacturing equipment (in the case of woodworking, sanders and saws) that remove debris from the point of origin as it is generated. That keeps the overall level of dirt down and shortens post-production cleanup. If, however, the vacuum will be used for general cleanup of work areas for approximately an hour or less each day, intermittent duty is best.

Operator-friendly features – Last, but not least, consider how easy – and safe – the vacuum is to operate. Will workers be able to easily dispose of debris, or will they have to go through a multi-step process? Can they "shake down" the main filter without opening the vacuum up and risking contamination? How much time will they have to spend maintaining and/or sanitizing the vacuum itself? Can they change out filters and replace parts quickly? Asking these questions will aid in product selection.

If you keep these key points in mind – and remember the importance of a high-quality, multi-stage HEPA filtration system – you will be fully prepared to select the best-performing industrial vacuum cleaner for your facility.

About Nilfisk CFM

Nilfisk CFM, the industrial vacuum division of Nilfisk-Advance America, helps its industrial customers meet their individual cleaning requirements and challenges with an extensive range of high-performance vacuum cleaners. From its Malvern, Pa. headquarters, Nilfisk CFM provides industrial vacuums for heavy-duty applications that require maximum suction power; and specialty vacuums for clean applications that demand "absolute" air purity and facility cleanliness. The company's vacuums are equipped with industry-specific features and exceptionally efficient filtration systems, ensuring dust- and debris-free facilities in the food, chemical/pharmaceutical, electronics, metalworking/powder coating, and a variety of manufacturing industries. For more information, visit www.nilfiskcfm.com.