Convenient, Efficient, Green Maintenance Chemicals

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Industrial manufacturers across the world need to stay efficient, productive, and safe in an ever-increasing competitive global market. They turn to industrial cleaners and degreasers to quickly and effectively sanitize and disinfect, improve the appearance of their facility, prepare surfaces for plating or adhesive bonding, eliminate the potential for contamination, and more. A variety of cleaning methods, including solvent degreasing and water-based cleaning, provide the means to effectively accomplish these tasks in challenging industrial environments.

While common household cleaning products are designed for maximum safety and minimum costs, industrial cleaners and degreasers are formulated to be effective and efficient. “[Household cleaning products] are nearly always water-based and have little if any solvent content,” explains Ed Williams, technical manager for LPS Laboratories, a provider of industrial maintenance chemicals. “Industrial cleaning products are formulated to provide the highest degree of cleaning efficiency for a given application, and use the most effective ingredients available.”

Cleaning Power

“Solvent degreasing is very popular as it is fast and convenient,” Williams says. “Very often no expensive application equipment is needed.” Solvents work by dispersing residues at the molecular level into the applied fluid, “much like sugar dissolves into coffee” and gives operators the impression that the residue disappears almost immediately after application, he adds.

Solvents help dissolve or liquefy the soiling media, and with surfactants that work to break the surface tension, ‘lift’ or rinse it from the surface to be cleaned, adds John Telles, chemist with Tri-Chem, a cleaning solutions provider. “With lower surface tension, aqueous mixtures are able to better penetrate blind holes, complex configurations (such as weaves and cloths), and tight spacing.” Oil and greases then dissolve rapidly by flowing away with the solvent and “disappear” from the surface. While fast and convenient, solvent degreasing also presents safety and environmental concerns such as toxicity to the operator, fire hazards, and air pollution issues, causing manufacturers to look for other, safer, alternatives.

“Water-based cleaners are often looked to as alternatives to solvents,” says Williams, “but these have their limitations.” Water-based cleaners work by dispersing and lifting small droplets of the soil from the surface, but “this often takes more time and may require the addition of heat and agitation to accomplish,” he adds. Much like creamer in a cup of coffee, Williams explains, which doesn’t

disappear and only slowly disperses without agitation.

“Water-based cleaners often require a bit of ‘elbow grease’ in order to work comparably to solvent degreasers,” he says. “This can be done by pressure washing at elevated temperatures, by the use of an application hose with a scrub brush attachment, or by the use of ultrasonic cleaning soak tanks.” The advantages of water-based cleaners include the fact that they tend to be safer than other industrial cleaning options. Water-based cleaners have low to no fumes, offer less product consumption (oil can often be separated from the cleaner and the cleaner reused, Williams explains), are generally cheaper to dispose of, and impact the environment much less than other industrial cleaners. “However, water-based cleaners often require rinsing to achieve a low residue surface,” Williams adds. “This can lead to rusting.” Soil removal with water-based cleaners also often takes longer than cleaning with industrial solvent degreasing.

And the effective, timely cleaning power of an industrial solvent degreaser or water-based cleaner is an important factor in these cleaners, especially as these chemicals become “greener” by “employing the technology of surfactants and solvents made from renewable resources,” says Telles. “These products include solvents made from soybean extract and the peelings of oranges. They also use products that eliminate the use of harmful phenolic based surfactants and replace them with ‘designed-for-environment’ (DFE) materials such as alcohol ethoxylates.” These greener products are indeed safer, lacking some of the most dangerous chemicals in these cleaners, but are not always as effective as their more traditional counterparts, Telles says. Just one more option in the array of today’s industrial cleaners.

Safety First

“In choosing an industrial cleaning agent, the end user needs to first of all consider safety and environmental concerns,” Williams says. A banned or undesirable chemicals list for the facility or company may limit the available choices, but the user still needs to consider the surface being cleaned and what soils will be present. “If you need to remove dust and dirt from sensitive painted surfaces, a water-based detergent is highly preferred over a solvent degreaser,” he says. “On the other hand, if heavy oil or grease deposits are being removed from unpainted metal surfaces, solvents are preferred. If work is being done around open flames or other non-electrical ignition sources, non-flammable solvent products should be considered.” Plastics and rubber compatibility, ventilation needs, drying times, and disposal concerns are other factors that demand consideration when choosing the right cleaner for the job. “High strength cleaning solvents that dry quickly often have odor and health concerns,” Williams adds. “Solvents that are less flammable and exhibit low odor may take longer to work.” Many cleaning agent suppliers offer a range of supplies, and it best to consult with a supplier representative during the selection process, he says.

And because industrial strength cleaners and degreasers use product that may not be considered safe for the environment, “one should also choose a product that will conform with all local disposal methods,” Telles adds. While some products might

be perfect for the job, they may not be allowed to be dumped down the drain at the end of the day for fear of contaminating the water supply. “So pick something that works,” he says, “but conforms to the protocols set forth by safety programs in the area and the facility.”

A facility’s safety data sheets should list the guidelines a user will need to follow, both for use and disposal. “A safety manager should be designated or employed to develop standards and observe the workers to ensure that the procedures are being followed precisely,” says Telles.

Elena Badiuzzi, the compliance manager with LPS agrees. “When working with hazardous chemicals, employers and employees should begin by reading the product label and Safety Data Sheet (SDS), formerly referred to as a Material Safety Data Sheet (MSDS). These resources provide a wealth of information regarding how to safely work with a product.” If a product is highly flammable, the manufacturer will advise a user to use non-sparking tools and explosion proof equipment along with common bonding and grounding techniques. This information will all be relayed via the SDS, making it an integral part of safe industrial cleaning. “With a combination of engineering controls (e.g. ventilation) and personal protective equipment, employers can prevent overexposures and ensure a healthy workplace for their employees,” Badiuzzi says. She adds that if a published SDS does not provide the right kind of, or enough, information on a chemical product, users should not hesitate to contact the manufacturer on the product label to get more information.

Chemical manufacturer representatives can provide on-site chemical safety classes, conduct a chemical assessment, and provide training in the use of new items, Williams adds. And he says, “a review of products purchased and a survey of where and how they are used is essential to minimizing safety, environmental, and disposal concerns with cleaning chemicals at any facility.”

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