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ISSUE HIGHLIGHTS:

Spill Solutions: Examining Choices for Industrial and Commercial Absorbents

Fluid spills are an unavoidable reality anytime an operation uses, maintains or repairs industrial or commercial equipment. Precautions can help limit the number or extent of spills, but even the best precautions will not be able to eliminate spills entirely.

For workplace spills, as with any type of workplace incident, the best solution is to avoid it in the first place. But despite measures to eliminate spills, they do happen.

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Below is a list of common causes and types of fluid leaks and spills in an industrial setting:

Hydraulic leaks – These are the frustrating, slow drip of hydraulic oils underneath equipment vehicles or machinery that require lubricant or coolant to operate. These leaks can occur while in operation or simply at rest, making it more difficult to troubleshoot or isolate.

Over-servicing of fluid chambers or reservoirs – Routine maintenance involves checking or topping off various fluid types such as brake fluid, coolant or some type of hydraulic fluid. During the process of filling, the chamber can end up with more fluid than needed, causing a spill.

Fuel leaks or spills – Despite numerous precautions and specialized equipment used for dispensing and using fuel, unexpected fuel leaks do happen. Problems can occur at the fuel depot where a driver can become distracted during a fill-up and the pump does not shut off or when there is damage to a fuel line, tank or reservoir that leads to loss of fuel.

Component replacement – After a period of operation, most trucks or equipment will require an overhaul of one or more major components, and this operation usually is the time when a large quantity of fluid is lost. For example, an engine radiator may require servicing or replacement, and the process of draining coolant out of the old unit or even adding fluid to the new radiator may result in excess fluid on the facility floor.

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The Absorbent Alternatives

A key component of a company's SOP is the material used to absorb the spill. There are a number of clean-up solutions available in the industrial and commercial market.

Crushed clay (aka "cat litter") – This probably is the most well-known product used primarily for oil and grease cleanup. Packaged and sold by numerous manufacturers and brands, this method has been around for more than 50 years and has been used by generations of mechanics. Despite its widespread popularity, crushed clay also is well known as a very dusty product that doesn't absorb well. That dust content is the effective part of the product, but it's also the same silica dust that causes respiratory health risks to workers. The product is very inexpensive, which is its main draw. Facilities that use crushed clay, however, will have to use excessive amounts of the product to accomplish any drying of spilled liquids and end up paying high disposal costs to remove the waste material. The total cost associated with using crushed clay in a facility results in a higher cost-per-use than most purchasing managers realize.

Sorbent Pads – Another popular and widely distributed choice, sorbent pads come in different shapes and sizes and most are made of polypropylene material, a petroleum-based product. The pads can leave a residue or slickness behind when they're picked up, and they can also pose slip-and-trip hazards for employees. Users have to be careful when removing or carrying the used pads, as they can drip and create additional areas of concern. Pads work best with certain liquids and do not perform well in open shop environments, as drafts can cause them to blow away. The disposal of these pads brings up some environmental concerns and requires special waste handling, increasing the costs of shop operation. The consensus is that pads are a high cost-per-use product that requires special waste disposal.

Alumina silicate – This material typically falls into the category of a zeolite or perlite. As an absorbent, it generally is a white color and has a very fine, granular consistency. This product is very lightweight and can be dusty, which can lead to eye or respiratory irritation. Some manufacturers have taken steps to reduce the dustiness by adding suppressants. This type of material, however, is known to absorb humidity over time, so it may gradually lose its effectiveness as an absorbent. The product's performance advantages are balanced against its dustiness and lightweight properties to limit its widespread adoption in commercial environments.

Diatomaceous earth (DE powder) – DE powder is another product comprised of naturally or artificially calcined remains of microscopic water plants. It's a mined product and starts out as hydrous silica formations and, when processed, becomes a fine, light-colored powder. It has a very high porosity formed by a vast number of air cavities, making it very lightweight and absorbent. The commercial form of this product can be very dusty, similar to silicate products and not a good performer outside or in shops with air circulation.

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The Absorbent Alternatives Continued...

Plant by-products – These are relatively new, biobased alternatives to crushed clay and pads and are derived from corn cob grindings, cellulose paper-based material, plant seed grindings, peat moss (Sphag) and even wood shavings. These products typically are selected for use with oil cleanup and once soaked with oil, can be burned to generate energy. Due to residue or slickness left behind after the first application, however, most users experience the need for follow-up cleaning or at least a second application of the product to complete the absorption job. Despite the product having some performance advantages, the dustiness and lightweight properties seem to limit these various forms of biobased products into widespread adoption by industrial facilities.

Montmorillonite – This new absorbent technology is developed from specialized soils with specific pH balance and ionic attractions to the chemicals in spilled liquids. Montmorillonite is biobased and possesses a large surface area and porosity, allowing it to perform well on a variety of spilled liquids. It is a low-dust material with the ability to encapsulate and bind with spilled liquids, potentially making the waste disposal much simpler. Because of its performance characteristics and less product required to absorb a spill, the volume of waste created is reduced along with accompanying labor costs. While this material has a higher cost per pound, analysis shows the use of the material can be more economical and have a lower overall cost-per-use.



Choosing an Absorbent

Common misconceptions in selecting the best cleaning solution include choosing the most widely used or least expensive products, but there are new choices available that clean more efficiently, save on labor costs, reduce the use of additional chemical degreasers and reduce the need for mopping with water-based cleansers than these “cheaper” products. Ultimately, certain absorbents deliver improved safety, less downstream waste and less impact on the environment.

The demand for absorbents is on the rise due to increased performance needs and environmental awareness and, as a result, the global market for absorbents is estimated at more than \$3 billion. Spills occur every day, and it’s clear there are many absorbent options available from which facility managers can choose.

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