

Spill Response Procedures & Sorbent Materials

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Introduction

[Emergency spill response](#) is an important part of a company's safety and health program. In the event of a spill, well-prepared companies are ready with a plan of action and the appropriate cleanup supplies. A simplified action plan for spill response might look like this:

1. Evacuate personnel from the immediate area of the spill.
2. Identify the spilled material(s).
3. Notify the spill response team.
4. Barricade the spill area and notify others in surrounding areas.
5. Extinguish or disconnect all sources of ignition and contact the fire department if the chemical is flammable.
6. Don the appropriate personal protective equipment.
7. Contain the spill.
8. Clean up the spill.
9. Dispose of the spill in accordance with local, state and federal regulations.

The Hazardous Waste Operations and Emergency Response Standard (HazWOPER) contains requirements for cleanup operations; corrective actions involving cleanup operations; voluntary cleanup operations; operations conducted at treatment, storage, and disposal facilities; and emergency response operations for hazardous wastes. The HazWOPER Standard, 29 CFR 1910.120, requires the following with regard to spill control:

(j)(1)(vii) US Department of Transportation specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spill, leaks, or ruptures may occur.

(j)(1)(viii) Where major spills may occur, a spill containment program, which is part of the employer's safety and health program required in paragraph (b) of this section, shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

In developing a spill containment program, you should have certain tools in-house and ready to use in case an emergency spill situation occurs. Spill containment tools can include drain

protectors, drain plugs, drum plugs, neutralizers and sorbents. This document will discuss various sorbents and their uses.

Sorbent Forms

Booms are cylindrical shaped and vary in length and width. Booms are used to control and contain spills. Some booms are made to be used to contain spills on water, and can be connected together and deployed onto the water as a large spill barrier.

Socks or *mini booms* are cylindrical shaped and vary in length and width. This form of sorbent is typically used in facility spill response or maintenance applications. Socks can be used to contain spills or placed around machinery or other equipment to contain leaks.

Pillows are rectangular in shape and filled with sorbent media. They're used to clean up medium-sized spills. Place pillows under drip pans to eliminate overflow problems, or use as a precaution for a possible spill when transferring liquids.

Pads and *rolls* are flat sorbent sheets available in unperforated rolls, perforated rolls or manufactured to a specific size, up to 300 feet long. Pads can be used to line shelves, catch leaks under machinery and clean up spills. Rolls can be cut to specific lengths for larger applications.

Loose sorbents are composed of sorbent media that is not contained in any type of pillow or mesh. Application of loose sorbents depends on the type of sorbent media used. Loose sorbents are typically used on small spills.

Sorbent Categories

The three categories of sorbents are: universal, petroleum and maintenance. These categories are made up of several different sorbent materials, including synthetics such as polypropylene; inorganic materials, such as expanded silicates and clay; and organic materials such as cellulose and wood fibers.

Universal sorbents are designed to absorb any liquid. They will absorb aggressive liquids such as acids and bases as well as non-aggressive liquids and solvents, such as cleaners, water-based fluids, gasoline and alcohols. Universal sorbents are made of polypropylene or expanded silicates materials.

Note: When cleaning up hydrofluoric acid, do not use an expanded silicate absorbent, as the expanded silicate material will react with the hydrofluoric acid. Instead, use a sorbent made of polypropylene.

Petroleum sorbents or "oil-only sorbents" are designed for absorption of oil and/or petroleum-based liquids. These sorbents are hydrophobic, which means they will not absorb water or water-based liquids. These can be deployed on water surfaces for emergency cleanup of spills, or used in maintenance applications for hydraulic and engine oil cleanup. Petroleum sorbents are made of polypropylene or treated cellulose.

Maintenance sorbents absorb non-aggressive liquids commonly found in manufacturing/maintenance operations. Examples of these liquids include coolants, lubricants, oils and cutting fluids. Maintenance sorbents will pick up water-based as well as oil-based fluids. These sorbents are typically made of recycled materials, such as cotton, wool, cellulose or corn cob. They can also be made of polypropylene, or a combination of the materials listed above.

Sorbent Capacity

Sorbent capacity can be listed by the amount of weight it will absorb in relation to itself ("Absorbs 12 times its weight.") or by its liquid capacity ("Absorbs 8 gallons."). For example, if a boom weighs one pound and absorbs 12 times its weight, it will absorb 12 pounds of fluid. However, since all liquids don't weigh the same per gallon, the weight capacity of the sorbent actually varies from liquid to liquid. So perhaps a more accurate way to assess sorbent capacity is by how many gallons it will absorb, or its liquid capacity. This amount will remain fairly static, regardless of the fluid weight. A boom that's four feet long and three inches in diameter will typically absorb 1 to 1¼ gallons of liquid. A pad that measures 16" x 20" and is 3/16" thick will absorb 28–32 fluid ounces. (Both of these examples are for polypropylene sorbents. Other materials may have different sorbent capacities.)

Sources For More Information

29 CFR 1910.120, *Hazardous Waste Operations and Emergency Response*

Emergency Spill Response Pocket Guide, Lab Safety Supply Product Number 26221

Commonly Asked Questions

Q. What is the difference between a sock, a dike and a boom?

A. Socks are more moldable than dikes or booms. The skin is constructed of a lightweight knit material. Socks are mainly used in maintenance applications for containing and absorbing liquids.

Dikes do not mold or form around equipment as well as socks, but are more durable. Dikes are used for containing and absorbing small and large spills in open areas.

Booms consist of a particulate-type absorbent covered with a porous fabric. Available in various diameters and lengths, booms are used for containing and absorbing large spills.

Q. Where can I find information on determining the absorbency rate of sorbents?

A. Specially developed tests are used for calculating the sorbent performance factors. The standard method of sorbent performance testing is described in detail in the American Society For Testing Materials (ASTM) standard F 716-82, the "Standard Methods of Testing Sorbent Performance of Adsorbents." Oil and water adsorption strength, buoyancy, absorbency and reusability are some of the tests included in the standards.

Q. What is the proper disposal method for saturated sorbents?

A. The handling, storage and disposal of these materials is governed by local, state and/or federal environmental regulations. It is the end user's responsibility to comply with the respective regulations.



Spill Control: Assessing Your Needs and Choosing the Right Sorbents

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Do you have leaks, drips, sprays or spills in your plant? Are you required to maintain a spill contingency plan? Are there any potential safety hazards around machines or in storage areas where a risk of injury or chemical reaction is possible?

The following questions were developed to help you determine your spill control needs and to answer your questions regarding a spill control plan. Use your answers to help you develop your spill control plan.

In developing a spill control plan, you should have certain tools readily available, either to use in case of an emergency, or to control daily leaks and spills around your plant. Be prepared. Choose the right spill control products, personal protective equipment and cleanup equipment to handle and manage the type, size and location of a potential spill, before it occurs.

Does your plant have a need for spill control products in any of the following areas:

Areas in which non-aggressive liquids (oils, coolants, solvents, water, etc.) are used?

Yes No

Areas in which petroleum-based liquids (gasoline, diesel fuel, crude oil, etc.) are used?

Yes No

Areas in which aggressive liquids (such as acids and bases) are used?

Yes No

Are these spill control products needed to:

Control the spread of leaks, spills, drips and sprays?

Yes No

Control leaks, drips and spray around machines?

Yes No

Protect walkways and personnel in high-traffic areas?

Yes No

Quickly absorb standing spills?

Yes No

Absorb liquids in high-traffic areas?

Yes No

Absorb liquids below machines, conveyors, valves, etc.?

Yes No

Spill maintenance products are used for everyday industrial situations involving cleanups or leaks. Typical maintenance leaks and spills involve oils, greases, lubricants, petroleum-based solvents, gasoline, diesel fuel, kerosene, water, water-based cleaning solutions, antifreeze or other non-aggressive fluids.

Examples of spill maintenance products include sorbent booms, pads, pillows, rolls and socks and loose sorbents.

Spill control products are items needed for larger spills and for spills involving aggressive liquids. Examples of spill control products include berms, booms, dikes, loose sorbents and neutralizers.

Sorbents can absorb, and/or contain virtually any liquid found in today's work environment. There are three categories of sorbents: **universal, petroleum and maintenance.**

Universal sorbents are designed to absorb any liquid. They will absorb aggressive liquids, such as acids and bases, as well as non-aggressive liquids and solvents, such as cleaners, water-based fluids, gasoline and alcohols. Most universal sorbents are made from either surfactant-treated polypropylene or expanded silicates.

Petroleum sorbents are designed for absorption of oil and or petroleum-based liquids. These sorbents will not absorb water or water-based liquids. Petroleum sorbents are made of polypropylene or treated cellulose.

Maintenance sorbents absorb non-aggressive liquids commonly found in manufacturing/maintenance operations. These sorbents are typically made of recycled materials, such as cotton, wool, cellulose or corn cobs. They can also be made of polypropylene, or a combination of the materials listed above.

- Sorbent pads or rolls may be used to catch leaks, drips and spray as they occur. They are also ideal for use in high-traffic aisles and next to machines. Pads may also be used below machines, conveyors and valves.
- Sorbent booms or socks may be used around machines to keep the areas clean, safe and dry from leaks, drips and spray.
- Sorbent pillows may be used for absorbing large amounts of spilled liquids. Universal sorbent pillows may be used for spilled aggressive liquids. They may be used wherever corrosives, oxidizers, flammables or other hazardous liquids are stored.
- Sorbent pillows with drip pans may be used for nuisance leaks and drips from spigots and pipes.
- Loose sorbents are formulated to maximize absorption and minimize dust. They may be used to absorb liquids in heavy traffic areas.

Commonly Asked Questions

Q. *What type of absorbent is needed for cleaning up hydrofluoric acid?*

A. When cleaning up hydrofluoric acid, use a sorbent made of polypropylene. Do not use an expanded silicate absorbent, as the expanded silicate material will react with hydrofluoric acid.

Q. *Are there specific training requirements for personnel who respond to chemical spills?*

A. Yes. These requirements may be found in 29 Code of Federal Regulations 1910.120, Hazardous Waste Operations and Emergency Response.

Q. *Are there specific regulations governing the disposal of sorbents saturated with hazardous materials?*

A. The handling, storage and disposal of sorbents, when saturated with hazardous materials, are governed by local, state and federal environmental laws.

Sources for More Information

29 Code of Federal Regulations 1910.120, Hazardous Waste Operations and Emergency Response

Emergency Spill Response Pocket Guide, Lab Safety Supply, Inc., Product Number 26221