

Drycleaning Containment Guidelines

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South Carolina Drycleaning Restoration Trust Fund

Drycleaning Containment Guidelines

*Information found in the gray boxes throughout this guideline offer further insight or suggestions on the topics discussed.
Please call our **Toll Free** number **1-(866)-DHEC-DRY**
(1-866-343-2379) if additional information is needed.*

*South Carolina Department of Health and Environmental Control
Bureau of Land and Waste Management
Revised June 2004*

South Carolina Drycleaning Restoration Trust Fund

Disclaimer

The information in this guideline will assist in complying with the Drycleaning containment requirements. These requirements are specified by South Carolina Law, Section 44-56-470, revised May 24, 2004.

This document contains suggested procedures necessary to meet the containment requirements. However, because every drycleaning plant is unique, these suggestions may not be appropriate for implementation at all drycleaning facilities. Each Drycleaner should thoroughly evaluate the potential costs and pitfalls before implementing any of these procedures.

Meeting the requirements of Section 44-56-470 will significantly reduce the environmental releases at drycleaning facilities; however, these requirements will not totally eliminate all potential releases. As a result, the owners and operators of drycleaning facilities are the most important component in preventing environmental contamination. Owners and operators of drycleaning plants must exercise due care to ensure that their operations do not become sources of pollution.

PART I: Containment Overview

Why are containment measures necessary?

Many drycleaning plants have environmental contamination because of minor leaks and spills of drycleaning solvents or process wastes. Some leaks occur from containers of solvent or waste stored outside of the drycleaning plants; however, many problems result from small drips of solvent on the floors inside the plant. Many of these solvent releases occur on a daily basis during normal drycleaning operations.

The leaking solvent contaminates the soil under and around the plant. It eventually seeps down to the water table where it contaminates large volumes of groundwater. One goal of the Drycleaning Restoration Trust Fund Act is to stop this type of ongoing environmental contamination from drycleaning plants. In order to reduce the potential for environmental contamination, containment measures should be installed to prevent spills and leaks of solvents from leaving the drycleaning facility.

South Carolina's environmental regulatory standards allow only a few parts per billion (ppb) of the drycleaning solvent to be present in the soil or groundwater under a facility. Even a few teaspoons of solvent can contaminate significant amounts of soil or water above these levels. The resulting contamination can potentially require hundreds of thousands of dollars to correct.

Where are the containment measures required?

Containment measures are required around all areas where drycleaning solvents are used or stored. In addition, you must have adequate containment measures around any waste that has been in contact with drycleaning solvents. There are specific requirements of the law that apply to the various areas of a drycleaning plant. **Part II** of this document details these requirements.

*One ounce of perchloroethylene released directly into water can contaminate nearly **two-and-a-half million gallons of water** above regulatory concentrations. Similar regulatory levels exist for compounds normally found in many common spotting agents.*

*Some compounds found in petroleum-based solvents have similar regulatory standards as perchloroethylene. Small releases of petroleum-based solvents may contaminate significant quantities of water; however, the amount of water that will be contaminated cannot be readily calculated since petroleum-based solvents are mixtures of many compounds. Generally, **one ounce of a petroleum-based solvent** released directly in water results in **several hundred thousand gallons of water** contaminated above the regulatory standards.*

Who must have containment measures?

Containment measures are required for operating drycleaning facilities to qualify for the Drycleaning Restoration Trust Fund. You must install containment measures if:

1. All of your drycleaning machines at the facility use perchloroethylene, or a similar type of solvent,

-OR-

2. Petroleum-based solvents are used in a drycleaning machine at the facility and you have opted to cover the facility under the Fund (i.e., you pay yearly registration fees and surcharges on your solvents into the Fund),

OR-

3. Your drycleaning facility started operating after November 24, 2004 (regardless of what type of solvent you use).

Are containment measures required for facilities that opted out of the Drycleaning Restoration Trust Fund?

Containment measures are not required by law for petroleum-solvent facilities that opted out of the Fund. However, containment measures are highly recommended for these facilities, in order to reduce their releases to the environment. Proper containment measures may result in significant cost-savings for these facilities since their owners and operators are solely responsible for paying all clean-up costs resulting from their releases.

These guidelines will allow a facility to meet the requirements of the Drycleaning Trust Fund, but will not eliminate all potential releases of solvents to the environment. Owners of facilities that opted out of the Fund should install more stringent containment measures to lessen their chances of releases and the resulting financial liability.

Are the containment structures required to be made out of a specific material?

The law requires that any materials used for containment must be compatible with the solvent used at the drycleaning plant. Since some materials may be compatible with one solvent and not the other, there is flexibility in the selection of the materials that can be used.

The material used for containment must be impermeable to the solvents in use at the plant and must extend under all parts of the equipment that hold solvent. A material is acceptable for use if the solvent does not dissolve it or otherwise cause it to leak after being in contact with the solvent for 72 hours. Bare, unsealed, concrete is not an effective material since both solvents readily penetrate to the underlying soil.

When are the containment measures required to be in place?

The law provides a grace period for existing drycleaning facilities to comply with the requirements. For a

drycleaning facility that operated before November 24, 2004, the containment measures must meet all of the requirements of the law by May 24, 2005.

Containment is not required if your existing facility stops operating before November 24, 2004.

New facilities that open after November 24, 2004, are required to have all containment measures in place before operating. The requirements are slightly more stringent for a new facility because better containment measures can be installed during construction. A new plant that does not have containment in place at start-up cannot legally receive solvent from a supplier.

New plants are required to pay the yearly registration fees and solvent surcharges into the Fund regardless of what type of solvent is used. Opening a new plant without containment measures in place at start-up forfeits any chance of ever becoming eligible for the Fund in the event that a release of solvent occurs.

Are there different containment requirements for Halogenated and Non-Halogenated solvents?

The law sets the same containment standard at all drycleaning facilities regardless of what type of solvent is used. Additional requirements may be applicable for facilities using petroleum-based solvents (*See Page 23 for further details.*)

SCDHEC has found significant concentrations of petroleum and perchloroethylene solvents under concrete floors of drycleaning plants. In all the cases that were tested, there were no obvious cracks or holes in the floors. Also, no large solvent spills were ever reported to have occurred at the facilities. Therefore, the contamination of the underlying soil is most likely the result of small, everyday solvent drips that soaked through the concrete over time

Are there different requirements for a new facility versus an existing facility?

Facilities that begin operating after November 24, 2004, must meet a higher standard for containment around the actual drycleaning machines and auxiliary equipment. A new facility must place their machines inside of a rigid, impermeable containment vessel (i.e., pan). In addition, a new facility may need a larger containment vessel than is required for an existing facility, depending upon the design of the machines and auxiliary equipment. (*See page 24 of these guidelines for New Facility Requirements.*)

New facilities and existing facilities must meet the same requirements for containment measures in their storage areas.

When will the Department inspect the containment measures?

The Department will not routinely conduct inspections; however, the Department may inspect the containment measures on a case-by-case basis. These inspections may be part of an investigation by other program areas of the Department including as part of hazardous waste generator inspections, complaint or spill responses, or other contamination investigations.

The Department will verify that the containment measures comply with the law before committing any money from the Fund to a facility. Typically, this will occur when the facility is determined to be a priority for further action.

Instead of routine inspections by the Department, the owners or operators of the drycleaning facility must certify that their containment measures are adequate. The owners and operators also have an on-going responsibility to ensure that their containment measures remain in good repair and are satisfactory for their intended purpose.

What are the penalties for not installing containment measures?

The law defines failure to install containment measures as an act of **Gross Negligence**. This will automatically result in the facility becoming **Ineligible** for the Fund. In addition to the loss of Fund eligibility, the site would no longer be sheltered under the Moratorium. Upon the loss of this protection, owners and operators would be required to assess and remediate any contamination attributed to their facility. The owners and operators would pay all costs of performing such activities.

The Fund cannot be used to pay for any assessment and remediation activities at Ineligible sites. Drycleaning facilities that operate after Fund eligibility has been revoked are still required to continue to pay yearly registration fees into the Fund.

The Drycleaning Trust Fund law also stipulates financial penalties for violations. These penalties can be as high as \$25,000 per day of operation without containment in place. In an enforcement case, other program areas of the Department can potentially impose these fines.

REMINDER

Notification of Spills Outside of Containment Structures

The Law requires that SCDHEC be notified immediately of solvent spills outside of a containment structure if the amount exceeds the Federal Reportable Quantity (RQ). The RQ for Perchloroethylene and other Halogenated solvents is one hundred pounds (approximately 8.3 gallons). The RQ for other solvents is defined as the amount that will cause a sheen on surface water. You must report any amount of petroleum-based solvent if it is spilled where it could run into storm drains or flow overland to any surface water body. You may report spills to SCDHEC's 24-hour toll free number: 1-(888)-481-0125.

What happens if an inspection finds inadequate containment measures?

Drycleaners will be required to correct deficiencies when they are found. The Department will attempt to work out a solution with the drycleaner so that correcting the deficiencies will result in only minimal disruptions to the drycleaning operation.

For major deficiencies, the facility's Fund eligibility can be revoked and financial penalties levied as specified by the Drycleaning Restoration Trust Fund Act. For minor deficiencies, the Department may allow some time (usually up to thirty days) to make corrections.

Typically, minor deficiencies can easily be avoided by corrective maintenance or simple changes in handling solvents or wastes. Minor deficiencies that are corrected will not affect the facility's eligibility for the Fund, or result in any penalties under the Trust Fund Act.

*The Department may determine that a containment problem is a **major deficiency** if there has not been a genuine attempt to contain the solvents. The following are some of the examples that may result in the Fund eligibility being revoked:*

- *Containment structures (trays under machines or containment dikes) have not been installed around drycleaning machines or solvent storage areas before the mandated deadlines.*
- *An owner or operator has falsely certified that the containment measures are in place when, in fact, they have not been installed.*
- *Minor deficiencies are repeatedly found that indicate the owner or operator does not consistently exercise due care to contain the solvents or waste.*

- *Minor deficiencies are not corrected within the time requested by the Department.*

*Generally, a **minor deficiency** occurs if there has been an effort to install containment measures, and these measures are simply lacking in their efficiency. Many of the minor deficiencies may occur because of wear and tear on the materials used for the containment system. Other minor deficiencies may result from an employee's unintentional misuse of the containment measures. The following examples are easily correctable minor deficiencies:*

- *The floor surfaces around the drycleaning equipment were sealed with epoxy paint. However, over the course of time, the paint has chipped and peeled so it is no longer an effective sealant.*

- *A metal containment tray was installed around the drycleaning machine that is large enough to hold a few extra containers of waste. While working on the machine, an employee places a bucket of separator water waste outside of the containment tray and forgets to return it to its original place within the containment structure when finished.*

- *A containment dike was built around an area where drums of waste solvent are stored. An inspector finds that several extra drums of waste have accumulated in the diked area. Because each of the stored drums takes up space (and containment volume) within the diked area, the remaining capacity of the diked area is not large enough to hold the required volume if one of the drums should leak.*

Correcting minor deficiencies may require additional containment structures, especially around the drycleaning machine. If there are valid reasons why these cannot be installed, the Department may accept an alternative solution on a case-by-case basis. Alternative solutions will only be acceptable to the Department if an impact on the environment is not expected to occur as a result.

Part II. Specific Containment Requirements

Containment around machines - Existing facilities.

The law requires that a containment structure must be placed around drycleaning machines and any auxiliary equipment that contains drycleaning solvent. You may have one containment structure that all of your equipment fits into, or each individual piece of equipment may have its own containment structure.

Installing one containment structure to hold all of the solvent-containing equipment is generally a better solution than having separate containment structures for each piece of equipment. By having all of the equipment inside one containment structure, any solvent leaking from pipe joints will probably be caught inside the containment structure.

Existing facilities have two options for installing containment structures around the drycleaning equipment. One option is to place the machines inside of a rigid pan, which can be custom-fabricated for your particular situation. The pans are usually made of heavy gauge metal with welded seams; however, other materials, such as fiberglass or chemically resistant plastic, are acceptable if compatible with the solvent you use at your facility. Another option is to retrofit by building a dike or similar structure around the machines.

Rigid pans provide the best protection against solvents penetrating through the floor of the plant; however, properly constructed dikes can be nearly as effective. It is usually necessary to raise the machines in order to install a pan, which often requires rerouting the machine's plumbing. Because of this, retrofitting existing machines with dikes is generally the easiest option to install. Dikes or pans must extend beyond under all portions of the equipment that hold solvent to catch any drips that may develop.

Containment dikes.

Existing facilities may build small dikes, berms, or other permanent structures around the drycleaning machine. Dikes can also be constructed around areas used for solvent storage at both existing and new drycleaning facilities. Dikes can be constructed around all four sides of the equipment if it is in the middle of the drycleaning plant. Alternatively, the dikes can be connected to the walls of the plant, so that the walls become part of the containment structure. Using the facility's walls as part of the structure will minimize the construction costs. Floor Surfaces within diked area must be sealed. (See **Page 20** for details on *Sealing Floors*).

When constructing any containment structure, it is important to keep its top surface essentially level and free of deep cracks or open seams. Otherwise, the lowest point along its edge will limit the structure's capacity because spilled solvent will overflow at that point. Similarly, holes that have been cut through the sidewalls of the structure to run pipes, etc., may significantly reduce the capacity if the holes are not sealed.

It is possible to construct berms around the drycleaning machines so that laundry carts may be wheeled over the containment structures. A berm is usually made of molded concrete shaped somewhat like a speed bump.



*If you build a containment dike or berm out of concrete, cinderblock, brick or other similar semi-porous material, you must seal the floors and interior surfaces of the dike so that spilled solvent will not soak through it. Likewise, you must seal any part of the facility wall that is used as part of the containment structure. (See **Page 20** for further details.)*

*Material used for containment must be **Impermeable** to the solvents in use at the plant. A material is acceptable for use if the solvent does not dissolve it or otherwise cause it to leak after being in contact with the solvent for 72 hours.*

Required containment capacity – Existing facilities.

Containment structures at an existing facility must contain at least one-third of the Total Tank Capacity of the drycleaning machine and auxiliary equipment. This requirement applies even if the machine is never filled to capacity with solvent.

A containment structure that is constructed to be just “barely big enough” may have insufficient volume once other pieces of equipment or containers are placed inside of it. When calculating the capacity of the containment structure, you will need to consider any loss of space taken up by equipment that intrudes into the containment structure. (See **Part III** .)

Containment around auxiliary equipment

If you choose to have separate containment structures around auxiliary equipment, each structure will need to hold one-third of the volume of solvent that is contained within the piece of equipment. These structures may be either rigid containment trays or retrofitted dikes or berms as described in the previous sections.

Depending on the plumbing valves connecting the various pieces of equipment, solvent may be able to flow into a leaking piece of equipment from your other equipment or storage tanks. If this is the case with your facility, then the containment structure must be capable of holding one third of the combined solvent volume of all of those pieces of equipment.

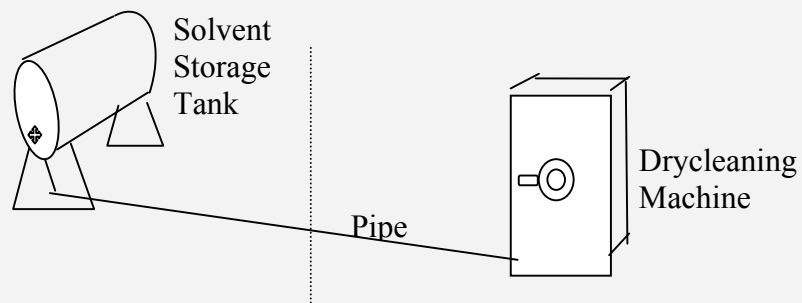
You are not required to have containment structures under the pipes connecting the drycleaning machine to the auxiliary equipment. However, because the pipe joints may leak, it is a good practice to extend the containment structures to be under any pipe fittings.

Total Tank Capacity

Normally, the Total Tank Capacity of each machine is the volume of solvent that the machine is capable of holding. This is usually based on the manufacturer's specifications for the machine. The Total Tank Capacity includes the volume of any solvent in connected piping, filters, and attached tanks.

Occasionally, the Total Tank Capacity will be larger than the manufacturer's stated solvent capacity. This occurs if no safeguards prevent solvent from flowing into a machine that is leaking. This depends on the configuration of your machine, auxiliary equipment, solvent tanks and cutoff valves.

*The **Total Tank Capacity** is increased if an outside solvent tank is permanently connected to the machine and the solvent flows by gravity to the machine. Even if the tank has a manual shut-off valve, the solvent in the tank could spill out inside the drycleaning plant if the valve is left open and the machine leaks solvent. In this instance, the Total Tank Capacity of the machine includes the volume of the outside storage tank. The containment structure around the machine would have to be designed to hold one-third of the combined solvent volume of the tank and the machine.*



***Note:** In this example, a containment structure is also required around the storage tank. Since the solvent cannot flow back from the machine, only the volume of the storage tank would need to be considered in designing the tank's containment structure.*

Special equipment - Spotting Boards.

Spotting agents contain small amounts of solvents. While there are only small amounts of solvent used at a spotting board, releases of these solvents over time can add to an environmental problem.

Releases must be controlled at the spotting boards; however, because of the small amount of solvent present, spotting boards do not have to be placed inside a containment vessel. Instead of placing a pan under the spotting board, the floor around the spotting board should be painted with an appropriate sealant. Generally, the floor should be sealed at least two feet in all directions from the base of the spotting board and in any other areas where the spotting agents could potentially be released.

Spotting boards typically have a container to catch the vacuum condensate water. These containers must be in place at all times and should be emptied regularly. The containers are prone to rusting and should be periodically replaced before they start leaking.

The small bottles of spotting agents should be stored in a tray that is deep enough to prevent them from being knocked off the board. The tray should be constructed of material that is resistant to the spotting agents and should be securely attached to the spotting board. Plastic washbasins mounted on the spotting board are usually suitable for this purpose.

The vacuum condensate water from the spotting board may contain significant levels of solvents. The water should be handled as a hazardous waste. This water cannot be disposed of by pouring it down the drain or onto the ground.

Containment around solvent and waste storage areas.

The law requires that containment structures must be installed around all areas where extra solvents or any wastes that contain solvents are stored. The containment structures must be able to hold all of the volume of the largest container that will be stored.

Reducing the amount of extra solvents and wastes that you keep on-hand may significantly lower your costs of adding containment structures. Most solvent suppliers and waste haulers can arrange frequent visits to your plant, so that you only need to have storage capacity for fewer containers of solvents and wastes.

You may store more than one container of solvent or waste inside the same containment structure. You may also store the containers inside the containment structures around your machine or other pieces of equipment. You should only do this if the containment structure will still have the required amount of capacity for the machine since each stored container occupies space inside the containment structure. Storing too many containers can reduce the overall capacity below the required volumes. (See Box **“Maximizing Containment Capacity”** on next page for additional details.)

The containment structures for your solvents and wastes can be either rigid containment trays or retrofitted dikes and/or berms as described in the previous sections. Alternatively, you may place smaller drums and bottles inside portable containment vessels, such as buckets or washbasins, as long as the portable containment vessel is impermeable to your solvents. These should be clearly designated only for containment use so that your employees do not defeat your efforts by using the containers for other purposes.

An important aspect of any containment program is instructing your employees in proper handling techniques for solvent and waste. You may be held financially liable for spills that result because of the actions of your employees.

S *Storage Containment Options.*

The law does not specify a particular type of containment system for your solvent and waste storage areas. This allows you to use a wide variety of readily available materials for containment as long as it is impermeable to the solvents in use at your facility.

Larger hardware and home improvement stores have various types of metal, fiberglass or plastic pans available that may be suitable for containing small drums and bottles. Some of the heavy-duty pans designed for mixing grout, cement mortar or wallpaper glues may even be large enough to contain all of your solvents and wastes that are not retained in the machine containment structures.

Larger metal or plastic drums may also be cut open to make a suitable containment structure to store smaller containers of solvent or waste.

Solvents stored on shelves also require containment. Smaller containers can be kept in open bins or small washbasins that sit on the shelves. Dikes or containment pans can also be placed under the shelf unit to catch any solvents that may be spilled. Shelving units that are against one wall are particularly adaptable to having dikes constructed under them as the dikes can be tied into the wall to minimize construction costs.

You should avoid stacking containers inside a containment structure. Stacked containers are easily knocked over and may break because of the increased distance they fall. Occasionally, containers at the bottom of a stack will rupture due to the extra weight of the other containers.

If it is necessary to stack containers, they should be placed near the center of the containment structure to lessen the risk of a container falling outside of the structure.

Maximizing Containment Capacity

A structure's containment capacity depends on the amount of free, unoccupied volume inside the structure. The structure must be able to hold all of the volume of the largest container that is stored. Each container that is stored **inside** a containment structure takes up space from the overall containment capacity (Figure 1). Consequently, the containment structure must be made larger to have sufficient unoccupied space.

Storing containers **above** the containment structure does not interfere with the available containment capacity (Figure 2). Metal grating placed across the top of the containment structure can make a secure platform to store the containers above the containment structure. Wooden pallets may also be used to elevate the containers without sacrificing much of the volume inside the containment structure.

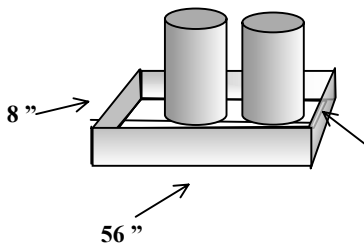


Fig. 1 55 gallon drums stored inside a containment pan:

36" Each 55 gallon drum uses up 2 cubic feet (15 gallons) of space inside a pan with 8-inch sides. The pan has 55 gallons of free capacity around the drums.

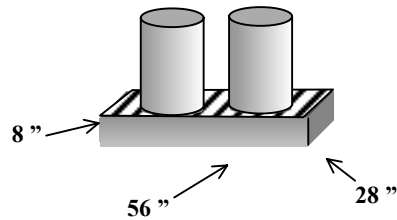


Fig. 2 55 gallon drums on grate over a containment pan:

This pan takes up 30% less floor space, yet still has 55 gallons of free capacity.

Commercial drum storage platforms are available from most industrial supply companies. These are designed with a reservoir underneath to catch any spilled solvent.

Many people find that it is somewhat easier to move the elevated containers in and out of the containment area because they do not have to lift the full containers up over the lip of the pan

Outside storage of solvents and waste.

Storing containers of solvents and waste outside of your plant creates additional problems:

- If not managed properly, rainwater collecting around the containers may become contaminated and require disposal as a hazardous waste.
- Containers exposed to the elements may deteriorate quickly and develop leaks.
- Vandals may create additional problems by opening storage tank valves, tipping over containers or even stealing the containers.

Due to problems that arise with outside storage, you should store all of your solvents and waste containing solvents inside of a secure building if possible.

If inside storage is not an option, your solvent-containing materials should be stored in a secure, locked enclosure surrounded by a containment dike.

You may be held financially liable for the resulting pollution if your outside storage area is vandalized.

Dikes, berms or other containment structures should be installed around all outside storage areas. Concrete pads alone cannot be considered a containment system. The structures must be able to contain the full volume of the largest container that will ever be stored outside of your plant. The floor and sidewalls of the containment system must be properly sealed to make them impermeable to the solvent in use at the plant. These sealants may require more periodic maintenance and frequent replacement because of the effects of weathering on the sealants.

Rainwater Management

Outside storage areas should be covered with a roof, tarp, or other means of preventing rainwater from entering the containment structure. If there have ever been any leaks or drips of solvent inside the structure, the rainwater collecting inside the containment structure will probably be contaminated above regulatory levels.

*Rainwater from inside the containment structures cannot be drained or poured off onto the ground without additional precautions. Only rainwater that **is known** to be free of solvents can be released. You should install locks on any drain openings so only an authorized person can open the drain after the rainwater is known to be free of solvents.*

You may be held financially liable for the resulting pollution if contaminated rainwater is released to the environment.

If there are any doubts about whether the rainwater is contaminated, it should be handled as a waste and disposed of by a licensed hazardous waste hauler. Other, lower cost, disposal options may be available on a case-by-case basis. You are urged to contact your local SCDHEC District office for assistance in determining the most effective solution in disposing of contaminated rainwater.

Sealing floor and other surfaces.

The law requires that floor surfaces around the machines, auxiliary equipment and storage areas must be sealed or otherwise made impermeable. If you have retrofitted containment structures by constructing dikes, berms, etc., then all surfaces on the inside of the containment structure must be sealed to create a solvent-tight structure.

It may be necessary to caulk cracks before sealing the area inside of a containment dike or berm. Caulking should also be applied around the bottom edge of the equipment to prevent solvent from flowing underneath the equipment to unsealed areas of the floor.

The floor surfaces outside of the containment structure should be sealed in areas where solvents could potentially drip onto the floors. The law requires that floors must be sealed to the extent practicable in all areas where any drycleaning solvents may leak, spill or otherwise be released. In most cases, applying sealant to the floor for a distance of two to three feet beyond the containment structures should be adequate; however, you may want to increase this distance if you have high-pressure lines that may spew solvents if ruptured. Floors should be sealed under any joints of pipes carrying solvent, as leaks are more likely to develop at these points.

While the concrete floors of many drycleaning plants appear to be impermeable to the solvents, in reality, they tend to be very porous. All commonly used drycleaning solvents easily go through unsealed concrete.

The linoleum tile squares used for flooring in many commercial buildings also allow solvents to pass through at the cracks where they are joined together. If your floor is linoleum tiled, the floor sealants may not properly adhere to the surface. You should check with the sealant's manufacturer to determine whether the sealant will be compatible. To avoid the problems that can result from tiles coming loose, you may want to remove the tiles and seal the underlying floors instead.

You must use a sealant that is compatible with your solvent and that will be impermeable for at least 72 hours. Your solvent supplier should be able to recommend a sealant that is appropriate for use with your type of solvent. There are also chemically resistant floor paints available from many industrial supply companies that are suitable.

Applying the sealant may take a couple of days for proper application and drying. Usually, you will need to either clean the surfaces with a strong cleanser or pressure wash in order to get good adhesion of the sealant. Floor sealants may be applied with paintbrushes or rollers. Good results can be also achieved by spraying.

Drycleaners have an on-going responsibility to ensure that the floor sealant remains intact. Floor sealants may need periodic replacement to be effective. Sealants in high-traffic areas of the plant are particularly prone to wearing out.

There are some concerns about sealed floors becoming slippery when wet. The sealants that we have observed applied to floors in drycleaning plants do not appear to have this problem. In fact, they appear to provide better grip for rubber-soled shoes. SCDHEC does not recommend the use of grit additives to improve traction, because the grit additive causes the sealants to degrade at a much faster rate.

Adding additional containment capacity Occasionally, a facility may have installed containment structures that are not large enough to hold the volume of solvent required by law. If this occurs, there are several potential remedies that may be applied as appropriate.

Occasionally, the containment structure may have insufficient capacity because the equipment or other containers use up some of the space. Elevating the equipment or containers onto grates over the containment structure may be all that is required to regain this lost space.

If the containment structure has a masonry dike or berm, increased capacity can usually be added by increasing the height of the dike or berm. To be effective, any vertical expansion of the dike will need to be sealed to make it impermeable to the solvent in use at the plant.

Sometimes it is not feasible to increase the height of a dike because a higher dike interferes with operation of the equipment. Sheet metal containment pans are also difficult to make deeper without expensive welding and metal fitting. If vertical expansion of the containment structure is not possible, a second containment structure may be added outside of the first one. This second structure could be in the form of a low berm that surrounds the first one.

Another option is to construct a diked area connecting to just one side of the original structure. If the diked area is built to one side, a notch, hole or pipe cut into the wall between the two structures will direct the solvent spill into the second containment structure.

*Special Considerations for
Drycleaning Plants using
Petroleum-Based Solvents*

Spill Prevention Plans

If you have any solvent tanks that are larger than 660 gallons, or ever have more than 1320 gallons of petroleum-based solvent on the premises, your plant is subject to the Federal Spills Prevention, Control and Countermeasures (SPCC) requirements. The SPCC requirements also apply if your plant has the capacity to ever have more than 1320 gallons of solvent and any other petroleum compound, including any waste that is contaminated with any petroleum compound. There may be severe penalties for not complying with the SPCC program.

The SPCC requirements are considerably more complex in their containment requirements and call for the submittal of an approved plan by a certified engineer. You may obtain a **SPCC Information Guide** from the Department's Freedom of Information Office at **(803) 898-3817**.

Containment for Petroleum Solvent Filter Wastes

Petroleum drycleaners may air-dry their spent drycleaning filters. Once the filters are completely dry, they may be disposed of as regular trash disposal. While they are drying, the spent filters must be placed inside a pan or bucket. In turn, these containers will need to be placed inside of a containment area in case the pan or bucket is turned over before all of the solvent has evaporated.

*Special Requirements for New Facilities
Starting Operation after November 24, 2004*

**Containment around machines and auxiliary equipment--
new facilities.**

The law requires that new facilities must use a metal pan or other rigid vessel around the drycleaning machine and auxiliary equipment. This vessel must be constructed of a non-reactive, impermeable material. Retrofitting with berms or dikes is not allowed around the drycleaning machines and auxiliary equipment.

(Note: Berms and dikes are permissible for the storage areas around extra solvents and wastes at new facilities.)

The containment vessel must hold at least one-third of the Total Tank Capacity of the machine or piece of equipment (*Example A*). In addition, the vessel must be able to hold all of the volume of the largest single tank in the machine or piece of equipment, if this volume is larger than one-third of the Total Tank Capacity (*Example B*).

Depending on the solvent pipe connections in the facility, the containment vessel may need to be much larger. If there are no safeguards to prevent a solvent storage tank from emptying into the machine, the vessel must also be able to hold all of the volume of the tank (*Example C*).

New Facilities must also meet all containment requirements for storage areas, as discussed on the preceding pages.

PART III: Calculating Volumes

Examples of Containment at New Facilities

Example A: A new facility has one drycleaning machine with a Total Tank Capacity of 120 gallons of solvent, including all of the solvent in the various interconnected apparatus. A schematic drawing of the machine shows it is composed of various filters, stills and small solvent tanks, none of which contain more than 30 gallons of solvent. The containment vessel must be capable of containing one-third of the Total Tank Capacity (i.e. 40 gallons).

Example B: A new facility has one drycleaning machine that holds 75 gallons of solvent. Most of the solvent, 60 gallons, is retained in one large tank at the bottom of the machine while the rest is distributed throughout various pipes, filters and separators built into the machine. Since the largest tank (60 gallons) is larger than one-third of the Total Tank Capacity (25 gallons), the containment vessel must be designed to hold at least 60 gallons of solvent.

Example C: A drycleaning machine at a new facility holds 50 gallons of solvent inside of its various filters, piping and internal storage tanks. The machine is connected via pipes to a 300-gallon aboveground storage tank located outside the plant. Solvent in the storage tank flows by gravity into the machine when a manual shut-off valve is turned on. Since there is nothing to prevent the valve from remaining open, the Total Tank Capacity of the machine is 350 gallons, including the capacity of the storage tank (50 gallons of the machine **plus** the 300 gallons of the storage tank). The containment vessel around the machine would have to have the capacity to hold 100% of the largest tank connected to the machine, i.e., 300 gallons.

Determining Containment Vessel Capacities.

Containment Structures are required by law to hold specific volumes of spilled solvent or waste. In order to determine whether the structure complies with the requirements, the capacity of the structure must be determined. The required capacity of the containment structure depends on where the structure is used. These requirements are summarized below.

Summary of Required Containment Capacities		
Containment Area	Required Containment Structure Capacity	Refer to:
Machine/ Auxiliary Equip. Existing Facilities	1/3 of Total Tank Capacity*	page 10-13
Machine/ Auxiliary Equip. New Facilities	1/3 of Total Tank Capacity* OR 100% of largest tank.	page 24
Solvent or Waste Storage areas	100% of largest container ever stored	page 14,18
*The Total Tank Capacity includes all solvent in any other piece of equipment or storage tank that can flow into the machine in the event of a leak (see page 13).		

The capacity of most structures can be estimated from measurements of the dimensions of the containment structure. Because some of the available space inside the structure may be occupied by pieces of equipment or containers, the calculations should take into account how much capacity is lost to the equipment and containers stored within the structure. These calculations are generally easier for rectangular or other regularly shaped containment structures.

For odd-shaped structures, the easiest way to estimate the capacity may be to fill the structure with a measured quantity of water. Care should be exercised to ensure that the water does not become contaminated with solvent or it may require handling as a hazardous waste.

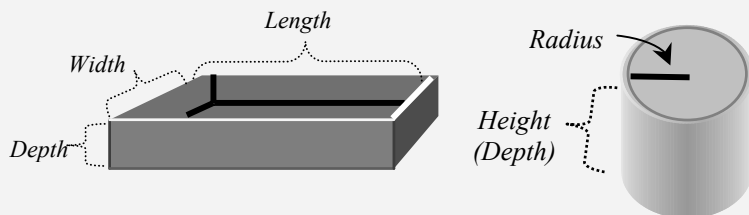
Basic Volume Calculations

The exact containment capacity does not have to be accurately determined as long as the capacity is greater than what is required by the law. Considerably more effort is required to determine the volume for containment structures that are “just barely big enough”. For these structures, it may be necessary to calculate the volume of solvent that would be retained in the piece of equipment in the event of a spill. The volume of most containment structures can be calculated using a few basic geometric formulas.

For **rectangular structures** and pieces of equipment, the basic formula for determining the volume is:

$$\text{VOLUME*} = \text{LENGTH} \times \text{WIDTH} \times \text{DEPTH} \times 7.5 \frac{\text{gallons}}{\text{cubic foot}}$$

(in gallons) (all dimensions measured in feet)



For **drums**, or other cylindrical containers, the basic formula uses the **RADIUS** of the cylinder. (The radius is half of the distance across the top of the drum). The Formula for converting the measurements of cylinders (in inches) to gallons is:

$$\text{VOLUME*} = \text{RADIUS} \times \text{RADIUS} \times \text{HEIGHT} \times 0.014$$

(in gallons) (all measurements in inches)

***VOLUME** refers to either the Overall Capacity of the containment pan or the Volume displaced by the piece of equipment or container.

Calculating Volume - General Rules:

1. All measurements should be made on the inside of the containment structure.
2. The “Depth” of the structure is measured to the lowest point along the structure’s wall where spilled solvent could overflow or pass through the wall (if not sealed).
3. The overall capacity of the containment structure is reduced by the volume of the equipment or containers stored inside the structure.
4. Only the portion of the equipment or container that is inside the containment structure actually displaces any of the volume (i.e., the “depth” of the containment structure is also the “depth” of the equipment).

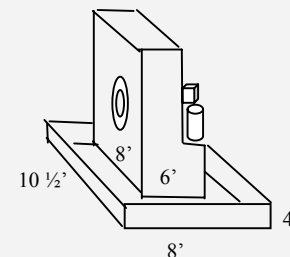
Example 1: The base of a drycleaning machine is 8 feet by 6 feet. The machine has a Total Tank Capacity of 75 gallons of solvent, so the containment structure must be capable of holding at least 25 gallons (i.e., $\frac{1}{3}$ of 75). The machine is inside a metal containment pan that is 10½ feet long, 8 feet wide and 4 inches deep (i.e., 0.33 feet deep).

The overall capacity of the pan is:

$$10.5' \times 8' \times 0.33' \times 7.5 = 208 \text{ gallons}$$

The volume of the machine inside the pan is:

$$8' \times 6' \times 0.33' \times 7.5 = 119 \text{ gallons.}$$



The capacity of the pan, after accounting for the volume lost to the machine, is

$$208 \text{ gallons} - 119 \text{ gallons} = 89 \text{ gallons} \quad (\text{exceeding the requirements for this machine.})$$

A *adjusting For Solvent Retained in the Equipment*

In Example 1, the capacity of the pan is much larger than the volume that is required for the machine. However, in many drycleaning plants, there is insufficient space to install such large containment structures. Occasionally, pans are constructed to be just slightly larger than the machine, and it may be necessary to consider whether some of the solvent would be retained in the equipment in the event of a spill. If this is the case, the calculated capacity of the containment structure can be adjusted to include the volume that would be retained in the equipment.

Example 2: *The base of a drycleaning machine is 8 feet by 6 feet. The machine has a Total Tank Capacity of 75 gallons of solvent. The containment structure must be capable of holding at least 25 gallons (i.e., 1/3 of 75). The machine is inside a metal containment pan that is 8½ feet long, 7 feet wide and 3 inches deep (i.e., 0.25 feet).*

The overall capacity of the pan is:
 $8.5' \times 7' \times 0.25' \times 7.5 = 112 \text{ gallons.}$

The volume of the machine inside the pan is:
 $8' \times 6' \times 0.25' \times 7.5 = 90 \text{ gallons}$

The capacity of the pan, after accounting for the volume lost to the machine, is:

$$112 \text{ gallons} - 90 \text{ gallons} = 22 \text{ gallons (Less than required)}$$

Examination of the machine shows that the solvent is stored in a built-in tank at the bottom of the machine, which occupies approximately half of the machine's base (i.e., approximately 8 feet by 3 feet). If a hole were to develop in the solvent tank, any solvent below the level of the containment structure's wall would remain in the bottom of the tank. The volume of the bottom tank in the containment structure can be added back to the overall capacity as this is solvent that would not leak out of the structure.

The volume of solvent that would remain in the bottom tank in the event of a spill is:

$$8' \times 3' \times 0.25' = 4 \frac{1}{2} \text{ gallons.}$$

Therefore, the actual capacity of the pan is:

$$22 \text{ gallons} + 4 \frac{1}{2} \text{ gallons} = 26 \frac{1}{2} \text{ gallons. (Barely meeting the requirement for this machine.)}$$

