



Designation: F 1127 – 88 (Reapproved 1996)

Standard Guide for Containment by Emergency Response Personnel of Hazardous Material Spills¹

This standard is issued under the fixed designation F 1127; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide describes methods to contain the spread of hazardous materials that have been discharged into the environment. It is directed toward those emergency response personnel who have had adequate hazardous material response training.

2. Referenced Documents

2.1 ASTM Standards:

F 716 Methods of Testing Sorbent Performance of Absorbents²

F 726 Method of Testing Sorbent Performance of Adsorbents²

3. Terminology

3.1 Definitions:

3.1.1 *absorption*—a process where the material taken up is distributed throughout the body of the absorbing material. (The body of the absorbing material must swell.)

3.1.2 *adsorption*—a process where the material taken up is distributed over the surface of the adsorbing material.

3.1.3 *gellant*—material that exists for both aqueous and organic materials.

3.1.4 *sorbent*—a material used to recover liquids (or fluids) through the mechanism of absorption or adsorption or both.

4. Significance and Use

4.1 This guide contains information regarding the containment of a hazardous material that has escaped from its container. If a material can be contained, the impact on the environment and the threat it poses to responders and the general public is usually reduced. The techniques described in this guide are among those that may be used by emergency responders to lessen the impact of a discharge.

4.2 Emergency responders might include police, fire service personnel, government spill response personnel, industrial response personnel, or spill response contractors. In order to apply any of the techniques described in this guide, appropriate training is recommended.

5. Containment Methodology

5.1 Containment equipment, procedures, and techniques can be categorized into three general functional classes: (a) patch/plug, (b) enclosure, and (c) immobilization. The important advantage of containment is that it restricts the spreading of a spill and makes cleanup easier. Careful selection of techniques and materials is required. Errors in judgment can lead to worsening of the situation, deflagration or detonation, and increased hazard to personnel involved in the cleanup.

6. Patches and Plugs (General)

6.1 Diminishing or stopping the flow of a leaking hazardous material is desirable in order to limit the size of the spill. The following techniques may be helpful in controlling leaks, provided response personnel can use them safely under existing conditions. Whichever method is used, it should be noted that the higher the pressure inside the container, the more difficult it is to plug the leak.

6.1.1 *Wood Plug*—Wooden cones and wedges may be hammered into leaking containers (drums, tanks, pipes, etc.). Softwoods in particular are easily sawed or lathe-turned and conform well to irregular shapes. Additionally, softwood may absorb liquid and swell, enhancing its capacity to seal a leak. Wedges or cedar shingles are especially applicable to splits, gouges, rips, and tears. Rigid plywood sheets can be fastened over a damaged area with “T” bolts, toggle/molly/butterfly bolts, straps, or by mechanical bracing and wedging. To minimize leakage between the plywood and the container, a gasket of rubber or plastic sheeting, putty, butyl rubber caulk, lead wool, or oakum may be used.

6.1.2 *Metal Sheet*—Various sizes of steel or aluminum sheets can be fastened over damaged areas by mechanical methods (“T” bolts, toggle bolts, bracing, strapping, etc.). Gasketing material between the metal and the container generally provides more positive sealing.

6.1.3 *Inflatable Plugs and Bags*—Reinforced rubber and coated-fabric plugs can be inserted into an opening and inflated with gas (air, nitrogen, carbon dioxide) or water to form a seal. Lead-sealing bags can be secured with straps, chains, cables, fire hoses, or bands to seal a leaking container.

6.1.4 *Fabric Patch*—Fabrics such as neoprene-coated nylon can be positioned over leaks and held in place by bands, chains, straps, etc. Wood, plastic, or metal reinforcements may be required.

¹ This guide is under the jurisdiction of ASTM Committee F-20 on Hazardous Substances and Oil Spill Response and is the direct responsibility of Subcommittee F20.22 on Mitigation Actions.

Current edition approved Jan. 29, 1988. Published May 1988.

² *Annual Book of ASTM Standards*, Vol 11.04.