

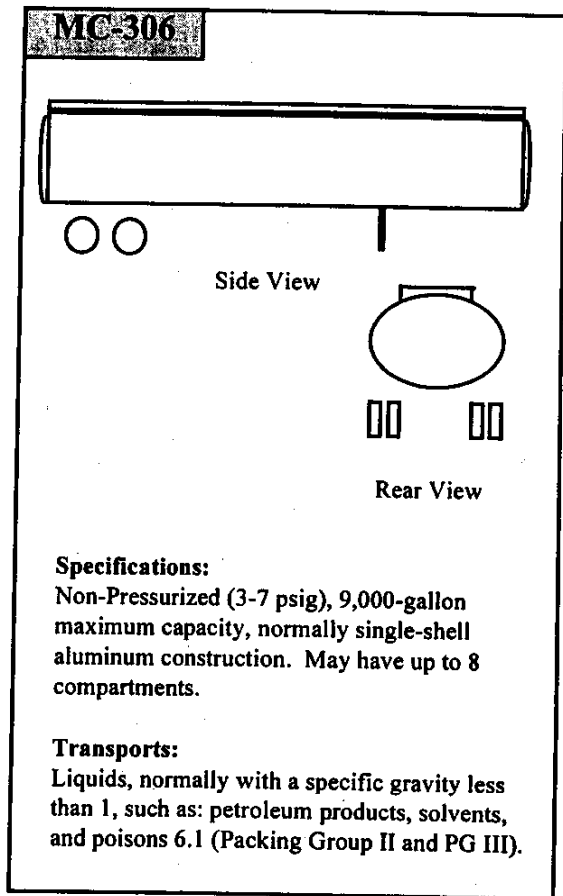
APPENDIX 4

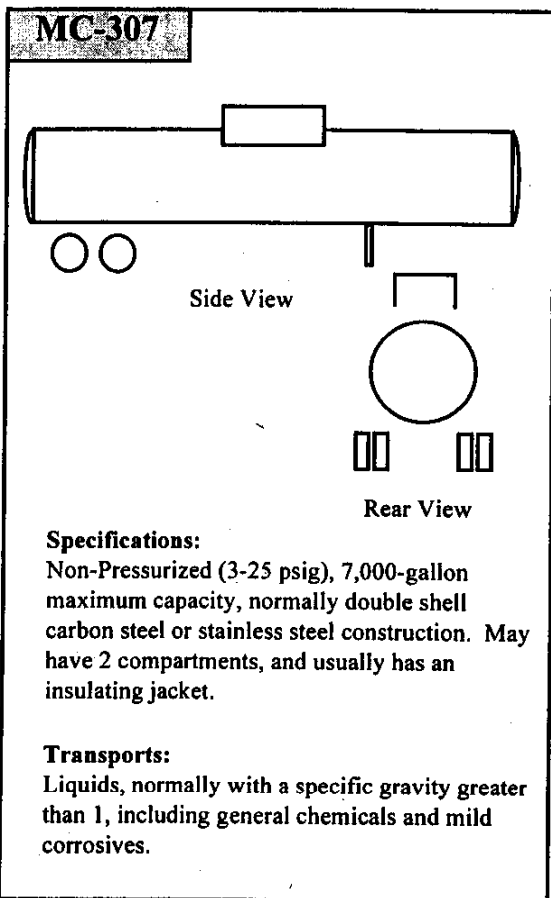
Container Silhouettes

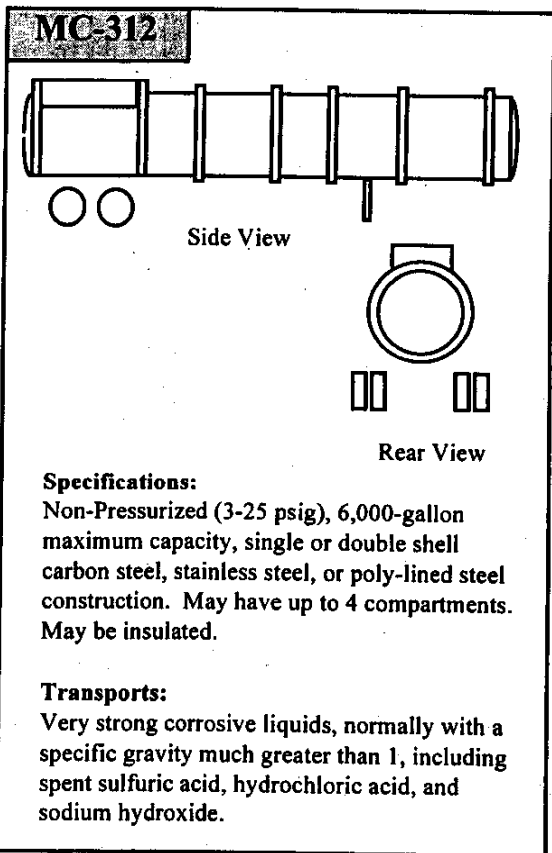
By using common sense, looking at what a container is made of and how it is constructed, responders can get some quick clues and general ideas about the material inside. Look for things like the construction material of the container (steel, stainless steel, plastic, fiberboard, glass, etc.) to make a rough determination as to its contents. Steel containers usually do not contain corrosive materials or oxidizing materials because these materials corrode steel. Plastic containers usually do not contain solvents or flammable materials because these materials usually dissolve plastics. Stainless steel containers are expensive to construct and are usually reserved for very corrosive materials or very strong oxidizers (materials which may destroy other types of steel and plastics). Fiberboard containers usually contain solid materials. Glass containers are used for a wide variety of materials. Look for other container clues as well, such as rounded or spherical shape (usually associated with pressurized materials), color (amber glass may contain light-sensitive materials), and types of openings (bungs, valves, ring-tops, etc.). All of these clues may help to identify the type of hazardous material involved.

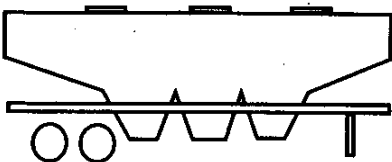
Over-the-Road Transport, Non-Pressurized

Of all the containers encountered, these are probably the most common. They can contain almost anything, and are all regulated by DOT with regards to construction and specification. The listing that follows specifies the DOT designation and provides a general description of the types of materials carried and a generic outline of the tank in question.

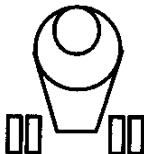






PNEUMATIC HOPPER TRAILERS

Side View



Rear View

Specifications:

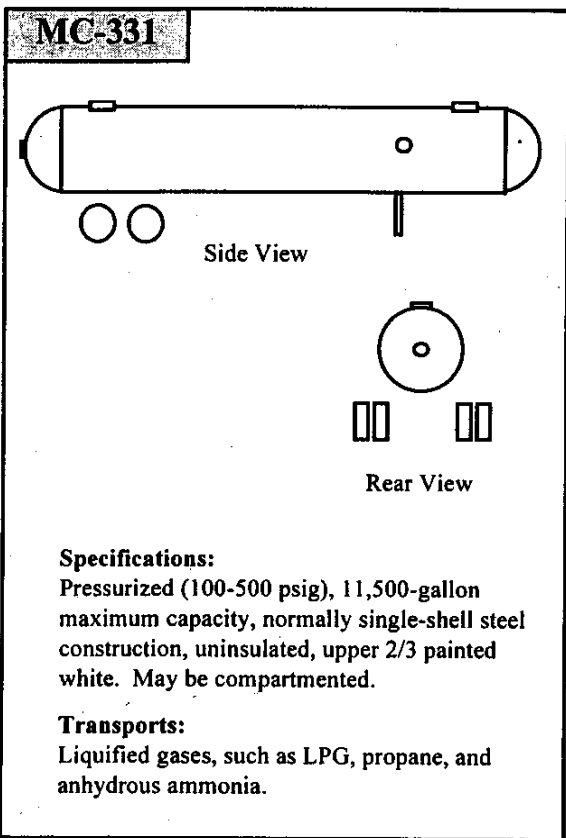
Non-Pressurized (3-25 psig), 1,500-cubic feet maximum capacity, usually single-shell aluminum or steel construction. May have up to 4 compartments.

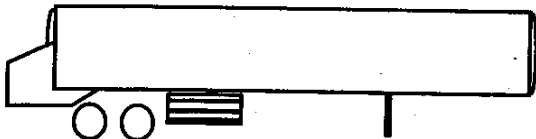
Transports:

Solids in powder form such as fertilizers, cement, and dry caustic soda.

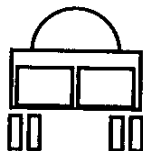
Over-the-Road Transport, Pressurized

These containers are also regulated by DOT, however they pose some slightly different hazards to responders than the non-pressurized containers. Pressurized containers may contain gases, liquified gases, or cryogenic materials, dependant upon the specific tank involved. In almost all cases, the materials these containers hold will be gases when released into the environment. This creates some significant hazards for responders, since gases usually have the greatest potential for migration, and therefore the greatest potential to impact a large area and a large number of people. Unfortunately, gases are also probably the most difficult state of matter to contain and control.



MC-338

Side View



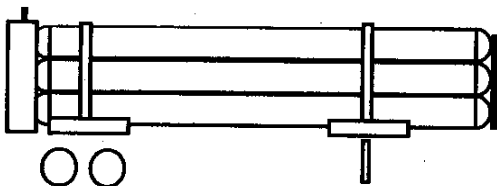
Rear View

Specifications:

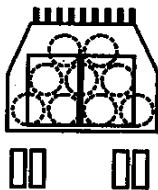
Pressurized (25-500 psig), 14,000-gallon maximum capacity, normally double-shell steel. Single compartments with relief valves (normally venting during operations).

Transports:

Liquified, cryogenic (-150°F or less) gases such as liquid nitrogen, liquid oxygen, and liquid carbon dioxide.

TUBE TRAILER

Side View



Rear View

Specifications:

High pressure (3,000-5,000 psig), 2 - 20 steel cylinders, all containing the same material and manifolded together at the rear.

Transports:

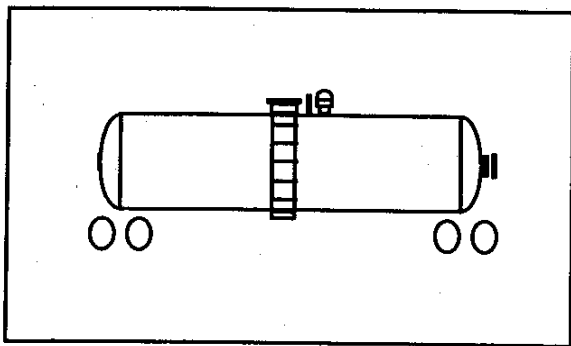
Gases under high pressure, such as argon, helium, oxygen, and nitrogen.

Rail Transport Containers

In general, rail cars pose significant problems to responders as a result of the quantity of material involved. Mitigation of an incident involving a rail car can tax resources, because in many instances local response organizations may not have the type or amount of mitigation resources required. In addition, rail cars involved in accidents can be damaged severely. These types of accidents can last for several days, pose substantial threats to the public and responders, and result in the release of large amounts of materials.

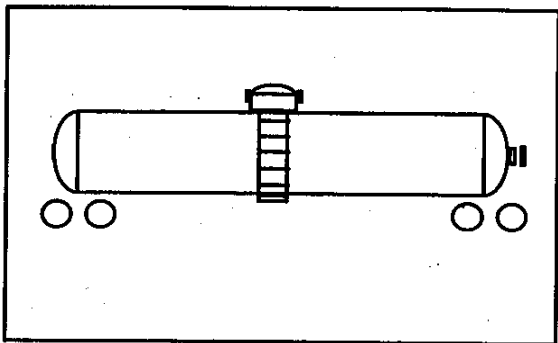
Rail, Non-Pressurized

Unlike over-the-road containers, it is not possible to determine whether a rail car is non-pressurized by the shape of the tank. Rail cars almost always have some type of an insulating jacket. This makes it impossible to see the tank and determine its shape. For rail cars, the best method of determining non-pressurized cars from pressurized cars is to look at the manway area on top of the car. Non-pressurized cars have a large, bolted manway with several fittings (relief valves, gauging rods, etc.) around it which are relatively unprotected. They will usually also have off-loading valves on the sides or bottom of the car.

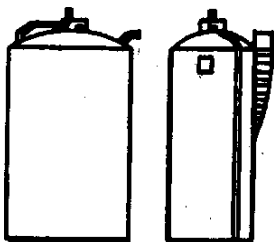


Rail, Pressurized

Pressurized rail cars will have a well-protected dome covering the valving assembly on top of the car. This dome is normally locked closed, and protects all of the off-loading valves and relief valves on the car. There will be no other valving visible on the car.

**Fixed Facility, Non-Pressurized**

Fixed facility containers can contain almost anything. These containers are normally fixed in place, and may be extremely large (containing millions of gallons of material, in some cases). Non-pressurized fixed facility containers, more correctly termed "atmospheric" tanks since they are generally at ambient atmospheric pressures, can normally be identified by reviewing the construction. These tanks may have dome roofs, geodesic dome roofs, floating roofs, or simply flat roofs. They are normally not constructed with rounded ends or edges.



Dome Roof Tank
STORES: flammable and combustible
liquids, chemical solvents, etc.



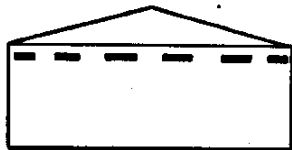
Cone Roof Tank
STORES: flammable, combustible,
and corrosive liquids



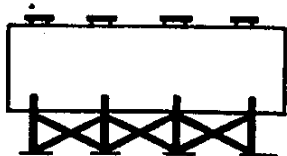
Open Floating Roof Tank
STORES: flammable and combustible
liquids



**Open Floating Roof Tank with
Geodesic Dome**
STORES: flammable liquids



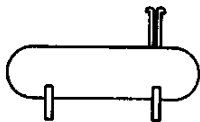
Covered Floating Roof Tank
STORES: flammable and combustible liquids



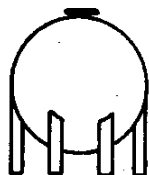
Horizontal Tanks
STORES: flammable and combustible liquids, corrosive liquids, poisons, etc.

Fixed Facility, Pressurized

As with any tank, pressurized fixed facility tanks will have rounded edges, and may even be perfectly spherical. They can be under very high pressure and usually contain relatively large quantities of gases, liquified gases, or cryogenic materials.



High Pressure Horizontal Tank
STORES: liquid propane gases, anhydrous ammonia, flammable liquids with high vapor pressures



High Pressure Spherical Tank
STORES: liquid propane gases



Cryogenic Liquid Tank
STORES: liquid oxygen (LOX), liquid nitrogen, and other liquified gases

Fixed Facility, Underground Storage

Underground storage is very common at fixed facilities. Underground storage tanks can usually be identified by manways, fill pipes, vent pipes, concrete pads with covered fill holes, or electrical cables entering or exiting the ground. These tanks primarily contain petroleum products, and may be extremely large.



Underground Storage Tank
STORES: primarily petroleum
products