

FLAMMABLE AND COMBUSTIBLE LIQUIDS

1. If a storage tank has contained leaded gasoline subsequent to its last thorough cleaning, follow instructions of manufacturers of tetraethyl lead
2. Have available the required personal protective equipment fresh air hose masks approved flashlights, safety belts and life lines, rubber boots and gloves
3. Remove all sources of ignition (matches, open flames, smoking, gas engines, welding, exposed electrical wiring and equipment) from the vicinity of the tank
4. Where gas or vapor that is likely to be ignited by a spark is present, use tools and equipment of spark-resistant material such as wood, fiber, bronze, stainless steel, Monel metal, or beryllium-copper
5. Bond steam lines and water wash nozzles to the tank
6. Empty the tank by pumping, draining, and floating tank contents with water
7. Disconnect and blank all product, steam smothering, foam, and similar lines. Do not rely on valves
8. Open all manholes and allow the tank to air thoroughly
9. Using necessary respiratory protection, test for vapor content with a combustible gas indicator
10. If light is needed, use only flashlights or electric lanterns approved for combustible atmospheres by Underwriters' Laboratories, Inc
11. For entering the tank before it tests vapor-free, wear a fresh air hose mask air supply tanks, and safety belt and life line if the tank atmosphere contains more than the maximum acceptable concentration of the vapor. Have ample help available outside for the number of men inside
12. Wash sludge, sediment, and scale from the tank through the drain or remove it with a pump. Flush out well and overflow the tank with water if necessary
13. Ventilate or steam the tank for the number of hours required by its size. If steam is used, cool and ventilate
14. Make a gas test and, if the tank is found vapor-free, check conditions in-

side the tank before issuing an OK for the work. Otherwise, clean and ventilate further as required

15. Continue ventilation for duration of the work in the tank, and make periodic tests for the presence of gases or vapors as the work progresses

Ventilation by air instead of steaming is used more widely where deposits of iron sulfide are not present and where a source of power supply for mechanical air removers is available. Special precautions are required for the servicing of tanks which contain pyrophoric iron sulfide. (See the API accident prevention manual *Cleaning Petroleum Storage Tanks* previously referred to.)

Cleaning small tanks and containers

General precautions Work on containers that have held flammable or combustible liquids or gases shall be under the supervision of a trained foreman capable of maintaining a high degree of safe operations. If the container has held such unstable compounds as nitrocellulose, pyroxylin solutions, nitrates, chlorates, perchlorates, or peroxides which may mean that it contains enough oxygen to support combustion, special precautions should be taken. Contact the manufacturer or supplier for specific information regarding cleaning procedures and other precautions.

Small tanks and drums should be cleaned and steamed in an open-faced building with ample roof ventilation. It is even preferable to clean them in an outside area free from ignition sources. Pipes and nozzles should be electrically bonded to containers being steamed.

Covers, plugs, and valves should first be removed and the tank or drum permitted to drain into a container. The inside should be examined for rags, waste, or other debris that might interfere with draining and retain flammable vapors. Only lights approved for use in NEMA Class I, Division I, Group D hazardous locations should be used for this inspection. Mirrors can sometimes be used to reflect daylight inside for this purpose.

Steaming Steaming, hot chemical wash, water filling, and use of inert gas are among the common methods for cleaning and vapor-freeing small tanks and drums.