

24—Materials Handling and Storage

permanently pivoted on a flange bolt, with one end acting as a gasket and the other as a blind, can be used

At the conclusion of a job on a pipeline containing corrosive chemicals, tools and personal protective equipment should be thoroughly washed with a reagent which will neutralize or remove the corrosive material and then rinsed in clean water, before the equipment is removed and the tools stored

Identification of piping. Distinctive colors for identifying piping have been standardized in American National Standard A13.1, *Scheme for the Identification of Piping Systems*, and are described in Chapter 16, "Industrial Buildings and Plant Layout," in the section titled Use of Color, pages 385-386

Specific identification of piping should be provided by a lettered legend which names the material being piped, summarizes the hazards involved, and gives directions for safe use. Stencils or decals may be used to apply legends

Legends should be made in accordance with MCA Manual L-1, listed in References, be moisture-resistant, and contain pigments that are colorfast

Portable containers. Where liquid chemicals are used in quantity, it is generally better to install pipelines and outside storage tanks than to use portable containers. Spillage is then reduced and localized, so that it is easier to take necessary precautions

Portable containers, such as drums, barrels, and carboys, should be correctly stored. The minimum of liquid should be kept at the point of operation, only enough for one shift is a common rule. The main stock should be stored in a safe, isolated place

If the liquid is corrosive or highly toxic, the storage area should be isolated from the rest of the plant by impervious walls and floor, with provision for safe disposal of spillage, or a separate building should be used

Floors in the storage area for corrosive liquids should be made of cinders, concrete treated to decrease its solubility, or other resistant material. Concrete is also satisfactory for flammable liquids. Good drainage will permit easy cleaning in case a container

in the storage area leaks or breaks

The storage area should be well ventilated, preferably by openings to the outside air equivalent to about 5 percent of the floor area. Whenever it can be used, natural ventilation is preferable to mechanical, because it involves no operating problems

Full drums should not be stacked, but should be placed in racks, preferably with a separate rack for each material. These racks should permit easy access both for getting the drums in and out and for ready inspection of the stock (Fig 24-11a and b)

Barrels may be stacked vertically with dunnage between the tiers, but are more conveniently handled if they are kept in racks similar to those used for drums. There should be equipment for moving barrels or drums in and out of racks and bracing to keep them in the racks

Be sure grounding is adequate, if flammable liquids are involved. See Chapter 42, "Flammable and Combustible Liquids," for details

Different materials should be stored in different designated areas, separated by wide aisles. Boxed carboys should generally be stacked not higher than two tiers, never higher than three. Not more than two tiers should be used for carboys of strong oxidizing agents, such as concentrated nitric acid or concentrated hydrogen peroxide

Before acid carboy boxes are handled, they should be inspected for corrosion of nails or weakening of the wood by acid

Before empty carboys are piled, they should be thoroughly drained and the stoppers replaced

Special equipment should include a long-handled truck (Fig 24-12) which picks up the boxed carboys under the handling cleats or between the bottom cleats provided on all standard 12- and 13-gallon boxed carboys. These trucks have handles long enough to keep the men handling them away from splashes, in case carboys are dropped

There is also less danger of dropping a carboy with this kind of truck than with the standard two-wheeled truck. The two-wheeled truck becomes a much safer device for handling drums and barrels, if it has a bed curved to fit the drum and a hook to catch the chime

The safest way to empty a carboy is to move