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Paints & Varnish

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before returning it. If there is any hazard in blowing down the cylinder or letting it leak, the vendor's advice in handling the cylinder should be followed.

9. A discussion about trucking cylinders without valve caps brought out that charged cylinders are handled in such a manner in transportation that the valves are protected against brackage and do not always require valve caps. This protection can be accomplished by crating the cylinder, which is often done for the smaller cylinders, by fastening the cylinder upright without valve protection caps to the truck so that there is less chance of a valve being broken off, and finally, by using valve-protection caps on cylinders trucked in other than an upright, locked position. Whenever possible, cylinders carried in trucks are banded down and kept firmly fastened between deliveries.

10. Most suppliers of high-pressure non-liquefied gases furnish valve caps with each cylinder and advise the user to keep valve caps on when the cylinder is not connected to a regulator. The need for returning cylinders with valve caps was restated.

11. Although ICC regulations cover only trucking across state lines, most gas producers try to follow these regulations at all times. It was pointed out that the National Safety Council Safe Practices extend these regulations from interstate to intrastate handling by repeating ICC regulations.

12. It was pointed out that users also could assist in the general safe practices involved in handling compressed gases by fastening cylinders in trucks and coupling them properly when returning them.

13. The perennial question of gas-content identification was discussed and it was agreed that the use of the marked name was the proper method of identification and that the use of color coding of industrial gases for content identification was unwise. The standard of identification established in the American Standard Association Cylinder Standard Z49.1-1934 was reaffirmed as the desirable guide.

14. The problem of preventing cylinder contamination by the user was discussed. It was agreed that the best immediate step was to secure user agreement to prevent cylinders being drawn down below 50 psi

in the case of a high-pressure non-liquefied gas. It was also suggested that changing plants consider the need for using a back flow check valve at the inlet of regulators used on compressed-gas cylinders. If such check valves are satisfactory, a good time to install these check valves would be when the customer is changing his regulator inlet connections to conform to the new inlet thread standards.

15. The need for colorants with the non-odorous flammable toxic gases was discussed. It was agreed that the purity requirements prevented this practice with the exception of the flammable fuel gases like the liquefied petroleum gases.

16. A member raised the question of the possible presence of an acetylene hazard in liquid-oxygen storage tanks. It was pointed out that liquid oxygen was made to strict purity requirements, that on rare occasions when problems from an air-compressor fire had temporarily raised the hydrocarbon content, the total acetylene plus hydrocarbons may run as high as 2 ppm. However, this amount of acetylene is soluble in liquid oxygen and passes off with the liquid as the liquid is used and presents no hazard.

17. In discussing the use of liquid oxygen in rocket work, it was noted that government personnel were accustomed to using the term "LOX" to designate liquid oxygen, not realizing that the word "LOX" was a trade name for an explosive compound of bags of carbon soaked in liquid oxygen. It was suggested that the Secretary of the I.A.A. approach the Department of Defense to discourage this usage. It was also suggested that the Federal Safety Council would be an ideal means of approach to the federal groups working on guided missiles.

18. In discussing the hazard of cleaning the inside of liquid-oxygen storage tanks, it was pointed out that the use of halogenated hydrocarbons for such cleaning should be discontinued if a man has to enter the tank to perform the cleaning operation. In such a case, some detergent would be recommended.

19. A request for advice on the handling of an acetylene cylinder which had caught fire was answered by reference to the I.A.A. publication on handling such burning cylinders. The main problem is one of good

judgment and a plan of action depending on exposure or size of leak.

20. A final rumor was reported that liquid oxygen might change composition on standing. This rumor was thought to be

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the result of confusion with the change that occurs in liquid air when it stands, whereby it is enriched in oxygen. Liquid nitrogen, having relatively little or no impurity, is practically unchanged on standing.

Points and Varnish

Discussion Leader: F. C. Gatusin, Safety Dir., Sverdrup-Williams Co., Chicago

The meeting of the Paint and Varnish Discussion Group was attended by 13 representatives of manufacturers, users and insurance companies. The chairman outlined the meeting's purpose and urged everyone to participate so specific problems, which may not have been covered in the general sessions of the National Safety Congress, could be solved.

Here are subjects which were discussed:

1. Here can a paint, varnish and lacquer user provide safe storage for the material?

Safe storage for paint, varnish and lacquer can be provided with a properly constructed inside storage and mixing room:

1. An inside storage or mixing room should be constructed so walls, floors and ceilings are non-combustible and carry a fire-resistance rating of not less than two hours. Two ways should be protected with fire doors, and the openings should be provided with self-closing doors, raised to a height of at least 6 ft.

2. Drains from the storage or mixing room should be directed to a safe location. Direct connection with municipal sewer systems should be avoided to prevent flammables from entering the sewer.

3. Electrical equipment in the room should be of the Class I Group D type (explosion-proof).

4. Adequate floor-level exhaust ventilation should be provided.

5. Heating in the area should be restricted to low-pressure steam or hot water.

6. Equipment, such as mixers, fillers, pumps and motors, should be electrically grounded. Effective grounding and bonding of containers during transfer of liquids must be practiced.

7. Automatic fire-extinguishing system should be provided.

Why are safety cans for flammable liquids painted red when red is the generally accepted color for fire-extinguishing equipment?

One participant indicated it was standard procedure to identify all flammable-liquid safety containers with yellow rather than the standard red. This would seem to have merit, since, obviously, the flammable-liquid container is certainly not a means for extinguishing fire.

One participant suggested that it is desirable to identify all material handling equipment: lift trucks, forklifts and hand trucks, with a highly visible color.

Use of yellow or orange for vehicles and material-handling equipment, can prove to be an important accident-prevention factor. If there can be obtained an easy-to-identify stamp for marking ground connections and bonding, and one that will insure electrical continuity.

This problem was apparently one that faced everyone in the discussion group. All recognized the problem of obtaining employee cooperation in utilizing bonding and grounding facilities.

The paint film on the drum, pail or other container provides an effective insulating barrier. The ground clamp must penetrate the film if effective bonding or grounding is to be accomplished. It was suggested that to help obtain employee acceptance of the need for effective bonding and grounding, on-the-spot demonstration—with an instrument measuring resistance—could prove helpful. It is simple to demonstrate insulating qualities of the paint film with the resistance indicator. Without penetrating the paint film, resistance to ground is in excess of 1000 ohms. Once the paint film is penetrated, resistance drops down to 6 or 8 ohms, providing satisfactory grounding.

A discussion took place concerning causes of accidents within the paint, varnish and lacquer industry. This discussion revealed the predominant causes were not directly associated with the manufacture of paint, varnish or lacquer. Accidents resulted, for the most part, from causes most commonly associated with any other industry, such as falls and material handling. This trend indicates that the industry has done a successful job controlling hazards arising from specific problems connected with paint, varnish and lacquer manufacture, but there still was a definite need for additional attention toward the prevention of accidents resulting from hazards not specific to the industry.

Several members reported that they had been employing LP-gas trucks in non-hazardous areas. Operations, to date, had been satisfactory with no apparent additional hazards being encountered. It was stressed that care must be taken in selecting a site

for the storage of bulk quantities of LP-gas. The storage site and refueling location should be separated from the plant by adequate clearances. Topography must be such that vapors will not flow from a leak into buildings, or other low areas, and accumulate and eventually encounter a source of ignition. Personnel responsible for the filling of tanks, and refueling of vehicles should be impressed with potential hazards and thoroughly trained in all aspects of the operation.

One of the group reported that the cap embossing, or stamping-machine operator in his plant suffered a finger amputation. To avoid recurrence, he had provided a barrier guard equipped with an electrical interlock that interrupted current to the machine when the guard was raised from position. In addition to utilizing the guard, it was suggested that employment of a stacker and automatic feed would add further to safety and efficiency of the operation.

Plastics

Discussion Leader: E. W. GRAHAM, Safety Dir., Monsanto Chemical Co., Springfield, Mass.

The Plastics Section Conference took place Thursday, Oct. 25, in La Salle Hotel for those interested in safety involving plastics materials.

First problem discussed was whether polyvinyl chloride exposed to high temperatures from burning or arc welding produced toxic fumes. After some discussion, it appeared that hydrochloric acid fumes could be given off when P.V.C. is exposed to elevated temperatures. Hydrochloric acid fumes are, of course, irritating and can be hazardous in high concentrations.

The next question concerned existence of engineering standards for flame arrestors on vent lines for flammable liquid tanks. At what point can flame arrestors be discontinued, and is there any size tank which would not require flame arrestors?

It was pointed out that various fire insurance inspection bureaus have varied standards. The Factory Insurance Association or Factory Mutual Company could be consulted for some specific problem. The consensus appeared to be that flame arrestors would not be required when the flash point was in excess 100 F. There was no definite con-

clusion regarding size of storage vessels, although it appeared that any tank or kettle inside a building should have its vent protected with some flame arrestor when in flammable liquid service.

Is there any restriction concerning use of cast-iron valves in flammable-liquid lines?

General opinion appeared to be that even though cast-iron valves might be used where the effort on the raw material was not a factor, steel valves were preferred. Cast-iron valves tend to become more brittle and might fail or break under shock treatment.

Some discussion was had concerning the bottom-unloading of tank cars of flammable liquid. Some members said they customarily bottom-unload by gravity. It was pointed out that the M.C.A. data sheets strongly recommended top-unloading. Some felt that it was perfectly safe providing an exit valve be installed on the bottom outlet of the tank car. The general opinion was that top-unloading by pump was the safer method. It was also asked why compressed air or inert gas under pressure should not be used. Again, consensus was that flammable liquids should not be unloaded under pressure. It

was pointed out that in case of line or valve failure, the flammable-liquid flow might not be stopped until air pressure from the tank could be vented and, with a partially empty tank, this could take a long time. Concerning tank cars, it was stated by several persons that occasionally the pressure-relief valve on the tank car is unreliable. They should be checked carefully by users. In use of tank cars, it was pointed out that occasionally tank cars are unloaded by nitrogen pressure. Care must be taken by subsequent users of this tank car to make certain before entering the tank cars that the car be adequately purged with fresh air. Checking of not only flammable-liquid concentrations, but also oxygen, should be routine.

Some discussion was had concerning permit system for tank entry. Most companies have a permit system. Some conference members indicated that where agitation was part of the tank system the fuses were removed from the main switch. Other members indicated that where disconnect switches were available and, in many instances they were installed adjacent to equipment of this sort, padlocking of these disconnect switches with retention of the keys by the operator make entry safe.

What type harness or life line should be attached to persons making tank entry?

Reference was made to the discussion by Bob Albisser at one of the Chemical Section sessions regarding use of airplane harness or wristlet. One person said his company attached a life line to a person's feet. Another stated he also attached a life line to a person's feet when bottom entry was made to tanks. Some companies favored the airplane harness, others the wristlet, as being the best type for kettles with small manholes. One company stated that the rope to the wristlet is secured to the forearm of the user with adhesive tape to keep the rope out of the way. Pulling on the rope would break the tape easily. One company has a tank-entry drill once a month for each crew. On tank entry, each crew has a hand-driven siren which can be used in case of an emergency.

Is there a maximum inside temperature which should be obtained before a person can enter kettles or tanks?

The consensus appeared to be that men should not enter tanks unless the temperature is below 100 F. This temperature can

be controlled by air circulation or jacket cooling. One company indicated that workers were not required to go in if the temperature exceeded room temperature.

The question was raised as to safe techniques of unloading tank trucks. Some of the comments were as follows:

a. Tank truck motor should be stopped unless the motor is necessary to operate the pump. In that event, the driver should stay out of the cab.

b. Tank truck should be immobilized, the driver giving the keys to the operator. This was not too feasible as many drivers do not want to give anyone their keys.

c. Portable standard signs could be located in front of the truck to prevent it being driven away while loading or unloading is taking place. A member mentioned the case of a cab driver who was overcome by carbon monoxide gas while sitting in a closed cab with the engine running.

Further questions on box truck loading and unloading were asked. One member brought out the point of a truck pulling away from the unloading dock at the same time a pallet of material was only half in the truck. Another member commented that when trucks are being loaded or unloaded, there should be a paper sign in the cab indicating such a process and the sign should be removed only by the loading or unloading crew. This latter comment did not appear to be of great interest. However, the loading and unloading of trailers with fork trucks received some attention. Some companies make it a practice to use wheel chocks under the box wheels whether a tractor is under a box or not. Some companies place pedestals to support the front end of the box truck when the tractor has pulled away—one pedestal for normal loading or unloading and two pedestals when fork trucks are being used.

One member requested information on peroxide handling. It was pointed out that a new bulletin has been published by the National Fire Protection Association entitled, *Safe Storage and Handling of Organic Peroxides*. It can be obtained by writing to the national group.

When tank cars or tank trucks have been unloaded, who has the responsibility of closing covers?

One company hangs a special tag, complete with unloading instructions, on the