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Date

October 17, 1974

Division

Originating Dept. Inventory Planning & Control
Packaged Goods

Location

Subject

Fluorocarbon Container-
Labeling Manual

Flow to

Attached is a copy of an article by D. D. Washburn, Customer Service Engineering Manager, outlining safe handling procedures of refrigerants.

This article should be placed under section "A" of your Fluorocarbon Container-Labeling Manual which was transmitted to you on November 30, 1972.

Periodically we will be sending you additional information to be included in your manual.

If you have any questions, please contact me.

Very truly yours,



H. C. Ullum

sgw

Attachment: (1)

Safe handling of refrigerants

Safety precautions for handling refrigerants to protect both personnel and expensive equipment

By D. D. WASHBURN, Customer Service Engineering, Refrigerants and Solvents, Process Chemicals Div., Union Carbide Corp., New York, N.Y.

ONE OF THE byproducts of today's boom in air conditioning and refrigeration, unfortunately, is an increase in accidents. These accidents rarely "happen" to expert air conditioning and refrigeration servicemen, however. They are more selective than that, preferring to trip up neophytes who have not yet learned that refrigerants are not to be taken for granted.

Experienced servicemen have learned to treat refrigerants with respect. One successful contractor, for example, keeps on his desk this list of safety tips for handling refrigerant cylinders:

- Blow out charge lines before filling, plugging ends wherever possible.
- Keep cylinder discharge valves clean.
- Replace the valve cap on a 145 psi cylinder when the cylinder is not in use.
- Always use a pressure gauge to charge a system.
- Strap or chain cylinders to a wall. Don't let them roll around when in transit.
- Refrigerant vapors are dense and heavy; they can collect in low spots and cause asphyxiation.
- Refrigerants boil at low temperatures, and boiling causes freeze burns to skin exposed to it; wear gloves and safety goggles for protection.
- Never tamper with cylinder safety controls.
- Go easy on muscle power when tightening a cylinder valve; the threads are easily stripped.
- Don't try to repair a cylinder

valve on the job; take it back to the shop.

- Don't heat a cylinder above 130 F, or permit it to stay in hot sun. Always store it in a cool, shaded area. If you must heat a cylinder, play it safe; use hot water.

A contractor reminds his men to think and act as chemists, always with caution. Many of the "tools" of the refrigeration industry are identical to those used by chemists to effect chemical reactions. The difference is that the last thing a serviceman wants is a chemical reaction. His job, in fact, is to make certain that the refrigeration system remains chemically stable.

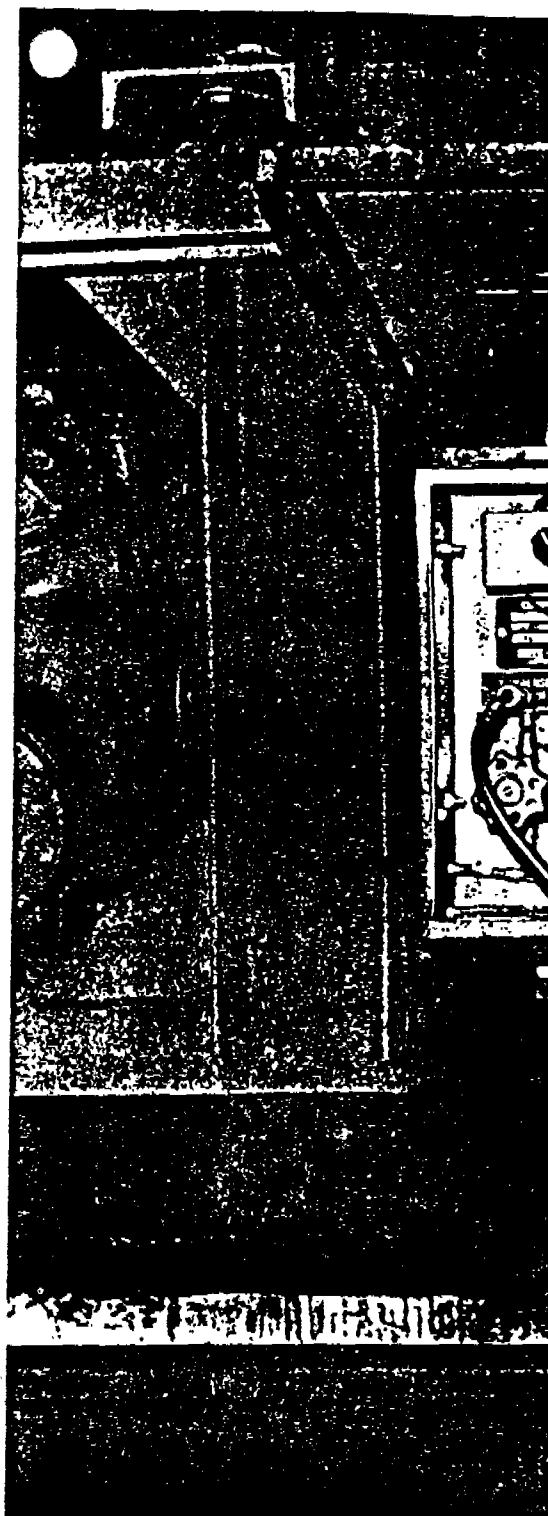
Yet like the chemist, he works with gases, acids, heat, vacuum, cold, oil, solvents, water, air, electricity. Small wonder that a moment of carelessness can have extremely unpleasant results.

A competent serviceman has to be enough of a chemist to know that when water and refrigerant mix, acid is formed; and acid means instant corrosion. It must be flushed out quickly and the system returned immediately to a dry, acid-free condition if the owner is to get the long, troublefree performance he expects.

Any gas under heat and pressure is potentially dangerous, and an experienced serviceman does not get careless with a refrigerant container and a blow torch. It may be tempting to use a torch on a cylinder to "get the last bit of gas out," but the results can be disastrous. The heating can soften

or melt the steel, turning a harmless looking cylinder into an uncontrolled rocket.

Heating with a torch bypasses the safety built into today's refrigerant cylinders. This is not only bad practice but bad chemistry as well. Two "reactions" can occur, both of them bad. First, heating a cylinder with a torch can cause





Sophisticated tools should be used in charging a system with refrigerant and checking for leaks.

chemical decomposition of the refrigerant. The higher temperature that builds up inside the cylinder can turn the refrigerant into an acidic and corrosive material that attacks compressors and other parts of a system.

Second, when refrigerant vapors are exposed to a torch outside the cylinder, where they can mix with

air, the result can be phosgene gas, which is extremely poisonous. This gas, which smells like fresh-mown hay, also has a very acidic by-product, HCl, which is extremely irritating to the mucous membrane of the nose.

To stress one precaution in the list above, never heat a cylinder above 130 F. Indeed, almost any

type of cylinder heating—blankets, strong lights, torches, etc.—is best avoided; but if it must be done, a positive control system is required to hold metal temperatures below 130 F. Remember that refrigerants boil at very low temperatures, and boiling liquid can cause serious burns.

Service with safety!

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