

Springfield

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Dept. - Opalon Suspension & Paste Resin

TITLE: USE OF RESPIRATORY PROTECTIVE EQUIPMENT

SAP84-618.01

I. SCOPE:

The following procedure specifies the requirements, use, care, maintenance, and inspection of respiratory devices in the PVC manufacturing area (Bldgs. 88 and 84).

II. GENERAL DESCRIPTION-EQUIPMENT AND PROTECTION:

In the PVC manufacturing area there are 4 classes of respirator equipment available. Following is a general description of the equipment and its intended use:

Scott Air-Pak (or Bulk Air System)

The Scott Air-Pak is the familiar yellow portable air bottle apparatus with associated complete face mask and air regulator. Scott Air-Paks are located in wall mounted yellow boxes in several locations in both 88 and 84 Bldgs.

The Scott Air-Pak and full face mask afford adequate respiratory protection from fumes and vapors of all process materials used in the plant. The Scott Air-Pak must be used where vapor concentrations exceed that for which other forms of respirator protection are recommended.

Recently bulk air tanks and associated hose and regulator have been placed on the 88 and 84 Bldg. kettle floors. This equipment with full air mask affords the same protection as the portable Scott Air-Pak and has a much longer air supply (approx. 2 hrs.).

Organic Respirator

The organic vapor respirator is the small nose and mouth covering rubber face piece with associated replacement cartridge. Either of two models are available in stores and stored in 88 and 84 Bldg. safety equipment boxes:

Mask

American Optical Model #2000
American Optical Model #3000

Organic Vapor Cartridge

#R31
#141

II. GENERAL DESCRIPTION-EQUIPMENT AND PROTECTION: (Cont'd)

Organic Respirator (Cont'd.)

The organic vapor respirator affords respiratory protection from all organic raw materials in 88 and 84 Bldgs. (except VCM and ammonia) but only for concentrations up to .1% by volume. Also, unlike the Scott Air-Pak, the organic respirator does not provide face and eye protection from corrosive materials.

Ammonia Gas Masks

These masks are full face-covering gas masks, (MSA Model 457082), with breathing hose and replaceable cartridge, (MSA Model 77707). They are stored in their own cases at the safety board in 84 Bldg. Spare cartridges are stored in the supply crib. The masks provide protection against ammonia vapors up to a concentration of 3% (30,000 ppm) and against all common dusts, including PVC. The masks also provide eye protection against irritating vapors. However, they do not provide protection against VCM in any concentration.

Dust Masks

There are 3 types of "dust masks" available in 88 and 84 Bldg. areas:

American Optical Model #R9100-rubber mask with soft felt type filter.

American Optical Model #2000 mask with #R17 replacement cartridge. (This is the same mask as used for the organic vapor respirator but with a different cartridge.)

3M Company non toxic particle mask--a white colored, lightweight paper type mask with small elastic strap.

Any one of these dust masks is adequate for respiratory protection against ~~nuisance~~ dusts which include 88 and 84 Bldg. solid raw materials and PVC dust.

III. REQUIREMENTS FOR RESPIRATORY PROTECTION:

Specific materials and jobs requiring the use of respiratory protection are as follows:

VCM

VCM has been labeled "cancer suspect" by the 1974 OSHA standard and a TLV (threshold limit value) established at 50 ppm. Since VCM "odor" cannot be detected below 260 ppm, there is no "warning" when exposure goes above 50 ppm.

III. REQUIREMENTS FOR RESPIRATORY PROTECTION: (Cont'd.)

VCM (Cont'd.)

No respiratory protection is required for jobs and work areas shown to have VCM exposures <50 ppm.

Jobs or areas which have been shown to have VCM exposures >50 ppm or where high VCM concentrations are suspect, require the use of the Scott Air-Pak or bulk air breathing system. The organic vapor respirator is not adequate for VCM concentrations >50 ppm. Jobs and areas which require Scott Air-Pak protection are as follows:

1. Working within 10 ft. radius of 88 and 84 Bldg. slurry or latex tanks if sight glasses, nozzles or other sealing component has been removed (includes cleaning dump baskets).
2. Draining water from RVC tanks - 88 and 84 Bldgs.
3. Draining off "old" kettle gasholder vent scrubber system- 88 Bldg.
4. Working within 10 ft. radius of ^{OPEN} kettle manhole if kettle has not been prepared for entry and if vacuum or Coppus blower is not being used to ventilate kettle.
5. Working within 10 ft. radius of any operation involving bleeding VCM lines or breaking VCM lines or equipment, bleeding strainers, changing filters, pulling pop valves from stack line.
6. Any tank entry where ventilation has not reduced concentrations to <50 ppm. (88 Bldg. kettle cleaning preparation reduces concentrations to <50 ppm if Coppus blower hose is inserted in kettle at all times and blower is operating.)

THF

THF has a TLV of 200 ppm but has a strong nauseating odor above 50 ppm, therefore giving good warning of exposure approaching the 200 ppm TLV. Normal operations in 88 Bldg. do not result in THF concentrations >50 ppm. However, spills, non-routine kettle entry (example: entering 87 kettle for chipping), maintenance operations, etc., could result in higher concentrations.

In cases where THF odor is objectionable and in all cases of vessel entry, THF concentration should be determined using the Draeger tube apparatus and action taken on the result as follows:

1. If concentrations are <200 ppm, no respirator equipment is required although the organic vapor respirator may be used to alleviate objectionable odor.

III. REQUIREMENTS FOR RESPIRATORY PROTECTION: (Cont'd.)

THF (Cont'd.)

2. If concentrations are >200 ppm but less than .1% (1000 ppm) the Scott Air-Pak (preferable) or the organic vapor respirator must be used.
3. If concentrations are $\geq 1\%$ (1000 ppm) the Scott Air-Pak must be used. (Organic respirator is not acceptable.)

NOTE: In cases of kettle entry, all reasonable attempts should be made to reduce concentrations to <200 ppm (water flushing, ventilation, etc.).

EDC

Ethylene dichloride (used in RVCN phenol addition system) is highly toxic with a TLV of 50 ppm. As it has a distinctive odor, there is a warning of relatively safe concentrations.

1. Normal EDC pumping operations do not result in EDC concentrations >50 ppm. However, if a spill or other situation results in objectionable odor or eye irritation, then the Scott Air-Pak will be required. (Organic respirator will not provide protection to prevent eye irritation.)

Ammonia

Ammonia has a TLV of 100 ppm, but its characteristic strong odor is detectable down to 50 ppm. Therefore, it is almost impossible to approach or exceed the TLV without knowing it. Normal concentrations in 84 Bldg. do not exceed 100 ppm, but in the event of an ammonia fan failure, large spill or non-routine entry into a concentrating tank or latex tank, larger concentrations may be encountered. The Draeger tube should be used to determine the actual concentration of ammonia in any of these cases.

1. If the concentration is <100 ppm, no protective equipment is required. However, wearing the gas mask will eliminate the ammonia odor.
2. If the concentration is >100 ppm, wearing the ammonia mask is mandatory while in the contaminated area.
3. If the odor of ammonia can be detected while wearing the mask and while using a fresh cartridge, the concentration of ammonia exceeds the mask capacity. Under these conditions the Scott Air-Pak must be worn.

III. REQUIREMENTS FOR RESPIRATORY PROTECTION: (Cont'd.)

Dusts

Solid raw materials used in PVC operations do not require respiratory protection. However, one of the types of dust masks may be used to prevent dust inhalation during dusty operations (i.e. weighing up B-2, limestone, etc.)

Exposure to heavy PVC dusting does require the use of the "dust mask" since there is some VCM contained in the dust material. Operations which require the dust mask are as follows:

1. Bagger operators and EPA's in 84 Bldg. when packing out.
2. All personnel in 88 and 84 Bldgs. when performing dusty operations, (includes dust collector entry-Pangborn and Pulsaire), and dusty housekeeping.

IV. EMERGENCIES

In any emergency involving large spills or other source of vapor release or fire producing smoke or fumes, the Scott Air-Pak should be used for emergency operations, cleanup, building entry, rescue, etc. The organic vapor respirator should not be relied upon as face and eye protection is not provided. High concentrations are not adsorbed and protection time from the cartridge is not dependable. Ammonia gas masks may be tried first in handling an ammonia spill, but if the odor of ammonia penetrates a fresh cartridge, the Scott Air-Pak must be used instead.

V. EQUIPMENT USAGE

- A. Scott Air-Pak - instruction for the use of the Scott Air-Pak are included in the Scott Air-Pak case and will not be treated here.
- B. Bulk Air System - instructions for the mask and harness regulator portion of the bulk air system are identical to the Scott Air-Pak. Specific instructions on the bulk tank are as follows:
 - 1) Before using the bulk tank be sure to check to see that the tank is indeed breathing air. All plant bulk tanks in the plant are painted yellow and stenciled "breathing air." (The plant fire department tests all cylinders to insure that contents is breathing air.)
 - 2) Attach tank end of flexible air hose hand tight to bulk tank and harness end to harness fitting.
 - 3) Turn off yellow regulator valve and red bypass valve on harness regulator.

V. EQUIPMENT USAGE (Cont'd.)

B. Bulk Air System (Cont'd.)

- 4) Turn on bulk tank main valve (counter clockwise).
- 5) Turn in (clockwise) bulk tank regulator valve until pressure reads 500 psi. (If pressure is < 500 psi, alarm bell will sound on harness regulator when "yellow" valve is turned on.)
- 6) Don regulator harness and mask and test mask and regulator as specified in Scott Air-Pak instructions. Utilize red bypass and yellow regulator valves as done for Scott Air-Pak usage.

NOTE: Secure bulk tank when in use. Do not depend on wheeled dolly to support pulling of flexible air hose.

- 7) When completed, coil and store hose on dolly; store mask and harness in storage cabinet.

If air tank pressure has been reduced to below 800 psi then return to Fire Dept. for refill.

C. Ammonia Gas Masks - instructions for donning the mask are the same as for the Scott Air-Pak mask.

- 1) Uncover the top and bottom openings on the cartridge. Save these caps.
- 2) Strap on the cartridge so that it rides high on the front of the chest with most of the weight suspended from the neck.
- 3) Don the mask and test the inlet and outlet valve functions.
- 4) Connect the hose to the cartridge before entering the contaminated area.
- 5) When finished, if you cannot smell ammonia in the mask, the cartridge can be reused. Replace the top and bottom covers, clean the mask and return all parts to the case.
- 6) While in use, leave the contaminated area at once and change cartridges if you smell ammonia.

V. EQUIPMENT USAGE (Cont'd.)

D. Dust Masks and Organic Respirator

- 1) Wearing the rubber type half mask (Model #2000 or R9100):
 - a) The rubber type masks have a "Derma-Safe" treatment on face piece headband and mask to destroy bacteria and fungi. However, if equipment has been used previously, use "Lysol" spray disinfectant cleaner located in 88 and 84 Bldg. kettle floors to clean mask.
 - b) Inspect the two rubber flap valves (inlet and exhaust) to insure that they are clean and intact.
 - c) Hold face piece in one hand and gather both straps in the other. Straps should be free of twists and be equal in length.
 - d) Place face piece over the nose and mouth and pull the straps over the head down to the back of the neck. Pull one strap up to the back of the head.
 - e) Using both hands, pull the face piece forward and reseat it on the face so it is comfortable.
 - f) Strap length must be adjusted to provide a firm fit, but not so tight as to cause unnecessary discomfort.
 - g) When finished with respirator, discard cartridge, clean mask with disinfectant and replace in protective equipment cabinet.
- 2) Respirator Cartridges - Dusts
 - a) As described in Section II, use cartridge #R17 or mask #R9100 for dust protection.
 - b) Dust cartridges may be used until breathing resistance becomes uncomfortable and then they should be discarded.
- 3) Respirator Cartridges - Organic Vapor
 - a) As described in Section II, use cartridge #141 or #R31 for organic vapor protection.
 - b) The effective time for the organic vapor cartridge depends on the concentration in which it is used but is approximately 30 minutes. When vapor odor begins to increase, the cartridge should be changed and the old cartridge discarded.

VI. RESPIRATOR INSPECTION

All organic vapor respirators and ammonia gas masks in the department will be inspected monthly as follows:

- a) Inspect for general condition.
- b) Replace cartridges as necessary to insure adequate supply.