

INDUSTRIAL MEDICINE

Industrial Health, Occupational Diseases and Traumatic Surgery

Carbon Tetrachloride

— In Industrial Hygiene —

Dental Ill-Health

— In Relation to Absenteeism —

Low Back Pain

— Some Anatomical Considerations —

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Acute and Chronic Toxicity

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The flow sheet shown in Fig. 5 indicates the steps in processing raw materials to synthetic Buna rubber. Organic reactants were stored in tanks and handled by pipe line throughout. The polymerization reaction was accomplished in emulsion, usually in soap water. The reaction vessel was closed and under pressure up to 100 pounds per square inch. In the three plants visited, no attempt was made to recover excess acrylonitrile, so that the reacted mixture was transferred directly from reactor to a semi-enclosed vat where addition of electrolytes caused coagulation. From this point to the drier, there existed potential exposure to excess acrylonitrile, since operations were either open or semi-enclosed. Some variation in procedure was seen in the three plants; for example, the lack of a drying step in one of them.

No attempts were made to obtain air samples for acrylonitrile since no adequate method existed. Observation of the process, however, indicated several points at which precautions should be taken when acrylonitrile is used:

(a) Leaks or breaks in pipe lines carrying acrylonitrile would be serious hazards. Personnel should leave the affected area immediately, and those who return to close valves and remove the residue should be equipped with gas masks approved by the U. S. Bureau of Mines for protection against organic vapors. Spilled nitrile should be washed down drains with copious amounts of water. Contact with the liquid should be prevented by use of rubber footwear and gloves, as it may be absorbed through the skin.

(b) Cleaning of reaction vessels after each batch operation is a severe potential hazard. Before a man enters the vessels, it should be purged by ventilation through a duct extending to the bottom of the vessel. The flow of air purged should be at least twenty times the volume of the container. In addition, the man entering the reactor should be equipped with a life-line manipulated by another person outside the tank, and rubber footwear and gloves to prevent skin contact with the sludge and loose material in the tank.

(c) Under normal operating conditions, some vapor exposure was possible in operations from the coagulator to the final press baling. To expedite inspection of the material, part of the top or inspection openings of the coagulator were usually left open. The vat should be equipped with sufficient suction ventilation to create an inward draft of about 100 f.p.m. through such openings to prevent escape of unreacted vapors.

Dewatering and washing operations at the separator may produce vapor exposure. Either enclosure of the separator or adequate local exhaust should be provided. Centrifuges, particularly, may produce considerable displacement of air and vapor into the surrounding atmosphere, and adequate exhaust ventilation should be provided at the periphery of the basket. Additional general ventilation may be required also.

Ventilation of enclosed conveyor driers is essential for the removal of water vapor and other residues evaporated from the stock. To prevent escape of these materials into the workroom, ventilation should be sufficient to provide an inward air velocity of 100 f.p.m. at all openings of the drier.

As far as is now known, the dried product presents no further hazard, and the final baling operation is innocuous. However, if baling or milling is done on the undried product, as noted in one plant, some vapor may be evolved from heat of compression. In such case, local exhaust ventilation should be provided to remove contaminants from the mill or press.

Conclusion

INCREASING use of synthetic rubber may intensify the

conditions now performed with petroleum fractions may require aromatic solvents, or others of equal toxicity. Such changes must be considered as introducing industrial hygiene problems, whose solution should be made an integral part of the planning program so that production will not be hampered at a later date by illness or psychological disturbances among the operators.

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Minimum Requirements for Safety and Industrial Health in Contract Shipyards

THE U. S. NAVY Department and the U. S. Maritime Commission have collaborated on the development of minimum requirements for safety and industrial health in contract shipyards. A manual of tentative standards was developed following a survey of the greater number of shipyards throughout the United States by experts in safety and in industrial health assigned to the U. S. Maritime Commission. These tentative standards were discussed in detail at a national conference conducted under the auspices of the Navy and the Maritime Commission held in Chicago December 7 and 8, 1942. The tentative standards with recommended changes were unanimously agreed upon at this conference and have now been published by the Government Printing Office. The regulations having to do with industrial health are given below.

In the development of these standards it has been recognized that it is vitally important to conserve manpower and promote the physical welfare, health and safety of what shortly will amount to one million workers in shipyards.

In carrying out the requirements of these minimum standards, JOHN ROCHE is serving as Chief Safety Consultant and PHILIP DRINKER as Health Consultant. Mr. Roche has a staff of four full-time men, one in each regional district, and Prof. Drinker has two industrial hygienists and a doctor on the Atlantic and west coasts, and an industrial hygienist in the Gulf and Great Lakes area.

The fact that the majority of these shipyards are built on made-land may introduce hazards which are difficult to avoid. Most of the yards include only a minute percentage of experienced workers, which also adds appreciably to the difficulty of the safety and health problems.

The introductory message to these requirements addressed to all contractors constructing ships for the Navy and the Maritime Commission, as signed by Frank Knox, Secretary of the Navy and E. S. Land,

Each contractor is hereby given notice that the Navy Department and the Maritime Commission will expect full and complete compliance with the minimum standards which bear the approval of the Navy Department and the Maritime Commission, and each is requested to give full cooperation to the consultants on health and safety who will be charged with the coordination and supervision of the safety and health programs of the two agencies. The cumulative restriction of manpower makes speedy attention and comprehensive action in respect to the subject matter hereof of vital importance."

S and H-1. Introduction

1.1 The standards for industrial health and safety as presented in this manual cover only minimum requirements. It is not to be assumed that compliance with these minimum standards is insurance of the development of good health and safety records.

1.2 It is recognized that in many shipyards, standards for health and safety are already in effect which go beyond the requirements of those listed here. The Maritime Commission and Navy urge that any standards of higher level be continued and that where substandard conditions of health and safety exist, they immediately be brought to the required standard or better.

1.3 In all cases the use of the words *shall* or *must* indicates that compliance with that section of the minimum requirements is mandatory. Where the words *should* or *may* are used the section may be considered desirable but not necessarily mandatory under certain circumstances which the contractor in his discretion may determine.

Minimum Requirements for Industrial Health

H-2. Medical Facilities

2.1 *Personnel.*—Yards employing up to 5,000 men should have two full-time physicians, and one additional physician for each additional 5,000 men. Yards with less than 2,000 to 3,000 men will not need full-time physicians.

2.2 Specialists in the various branches of the medical profession available in the area should be consulted as indicated.

2.3 Yards employing up to 5,000 men should have in the main dispensary six full-time nurses and three additional nurses for each additional 5,000. Additional nurses will be required for first aid stations.

2.4 There should be at least three clerks employed in the medical department for each 5,000 employees.

2.5 One ambulance driver should be available per ambulance per shift.

H-3. Physical Facilities

3.1 The medical department should be provided with:

- a. A waiting room with suitable registration facilities.
- b. A general treatment room.
- c. An eye treatment room.
- d. A minor surgery room.
- e. A ward with three beds for the first 5,000 employees, and one bed for each additional 10,000.
- f. Doctors' offices and private examining rooms.
- g. A nurses' office and dressing room.
- h. X-ray room for yards employing 5,000 men and above.
- i. A physiotherapy room.
- j. Toilet facilities for doctors, nurses, and patients.
- k. A storeroom for general medical stores.
- l. X-ray files and viewing room.

3.2 First-aid treatment rooms, manned by nurses, should be provided wherever there is overcrowding at the main dispensary and loss of time due to distance from shipways and shops. These sub-stations may be located under building ways or near locations where the number of men working is large so that the distance a man need travel to a sub-station will not exceed approximately 400 yards.

H-4. Equipment

4.1 The following equipment should be provided:

- a. One ambulance for each 15,000 employees, or reasonable fraction thereof, with an ordinary passenger car always in reserve.

b. In some yards a station wagon is used satisfactorily inside the yard and an ambulance used only for trips outside.

c. An x-ray unit for yards employing about 5,000 men and above.

d. Medical and surgical stores required for minor surgery, eye injuries and physiotherapy.

H-5. Records and Forms

5.1 The following records and forms are recommended:

NOTE.—In an emergency no form need be filled out.

a. A form authorizing the workman to report to the medical department for examination or treatment issued by a foreman or leading man or other supervisor. This shall show time of issue, arrival at dispensary, discharge from dispensary and return to work.

b. Appointment form for revisits and retreatments issued by the physicians and nurses.

c. A disposition form issued by physicians and nurses indicating return to work, hospitalization, to home, or other disposition.

d. A complete and accurate permanent filing system recording personal data, nature and cause of injury, diagnosis, treatment, disposition, and results.

e. The necessary state and insurance company forms.

f. Daily report to the safety department showing all new cases for the day, together with the nature and cause of injury, and the diagnosis.

g. The adoption of the standard nomenclature when made available by the Council on Industrial Health of the American Medical Association, Chicago.

H-6. Examinations

6.1 Physical examinations to insure proper placement of employees shall be given.

6.2 Periodic check examinations shall be given men working in occupations potentially hazardous to themselves or others, as for example to crane operators, locomotive and hoisting and portable engineers. Periodic check examinations should be given men in jobs in which there may be health hazard, as for example to sand blasters, radium and x-ray workers, and paint sprayers.

6.3 Special examinations such as x-ray, serologic and urinalyses shall be given in the individual case as indicated and in accordance with local needs.

H-7. Air Raid Precautions

7.1 The medical department shall locate, equip, and maintain such emergency first aid dressing stations as may be deemed necessary to handle air raid casualties.

7.2 A certain number of yard employees shall be trained in first aid procedures to render assistance to the medical department in handling air raid victims.

7.3 Close cooperation should be maintained with the local civilian defense officials in order that evacuation and care of air raid victims may be carried out to the best advantage.

7.4 In keeping with local army and navy regulations, steps should be taken to provide protection of dispensaries by sandbags, or otherwise, from fragments and concussion of bombs.

H-8. Responsibilities of the Medical Services

8.1 Frequent inspection of the yard by the medical staff shall be required in order that physicians may become familiar with shipyard jobs and thus help intelligently in preventing accidents and occupational disease.

8.2 Close collaboration shall be maintained with the safety department especially in regard to records of accidents and absenteeism.

8.3 It shall be the joint responsibility of the medical and safety departments through the supplies department to know the composition of paints, thinners, paint removers, and other chemicals used in the yard, and to see that the workers exposed are protected by the best safety practices.

8.4 As in the general practice of medicine the confidential relations of doctor and patient shall be maintained.

8.5 It is certain that in the near future women in large numbers are to be employed in the mechanical trades. It is necessary in shipyards to make special provisions for this class of patients. This will necessitate the establishment of separate waiting, treatment, and examining rooms. In

fards where the number of employees is large, it may be logical to establish a separate dispensary for the handling of women patients.

H-9. Sanitary Inspections

9.1 *Cafeterias and canteens.*—It shall be the duty of the department to adapt from Army and Navy standards, reasonable conformity with the local health department, an inspection scheme to include pre-employment examination of food handlers, quality and quantity of food, general cleanliness and comfort, screening, dishwashing, garbage and waste disposal. These inspections shall be made at unscheduled times and never less than once each week.

9.2 *Water supply, sewerage, and waste disposal.*—In cooperation with Maritime and Navy engineers the medical department shall inspect and report upon the above as often as seems advisable, but not less than twice yearly.

9.3 *Salt tablets.*—Salt tablets shall be made available to all employees and shall be kept in covered dispensers approximately located.

H-10. Respiratory Protective Equipment for Shipyards

The U. S. Bureau of Mines, 4800 Forbes Street, Pittsburgh, Penna., maintains a laboratory which tests and approves for use in industry respiratory protective equipment of all kinds. The Maritime Commission and Navy will require the use of approved equipment throughout all yards. The safety department shall be responsible for instructing men in the proper use of such equipment and for the maintenance of ample supplies.

10.1 Details of Bureau of Mines respirators with names of manufacturers, prices, and descriptions can be obtained from the Bureau or from the Maritime Commission.

10.2 The safety department shall be responsible to the management for cleaning and sterilizing all such equipment as often as may be agreed upon with the medical department. (A method for such sterilization is included in these standards; see section H-12.0.)

10.3 *General requirements for respirators.*—
a. Protection as defined by American Standard for the Protection of Heads, Eyes, and Respiratory Organs. Handbook H-24, Nov. 1, 1938. Superintendent of Documents, Washington, D. C.; price 15c.
b. Comfort (light weight and not obstructive to vision).

H-11. Jobs Requiring Respiratory Equipment

11.1 Dust.

JOB	PROTECTIVE DEVICES
in of Sand Dusts (as in sand blast)	(1) Abrasive blasting helmet. (2) Dust respirator.
ed Dust (as in milking point)	(1) Air line respirator. (2) Lead dust respirator.
bottoms (as in covering pipes)	(1) Air line respirator. (2) Dust respirator.

11.2 Metal fumes and smokes.

JOB	PROTECTIVE DEVICES
ed and zinc oxide from welding and burning.	(1) Air line respirator. (2) Fume respirator for lead. (3) Dust respirator for zinc oxide.

11.3 Solvent vapors.

JOB	PROTECTIVE DEVICES
ry painting, both indoors and outdoors.	(1) Air line respirator. (2) Chemical cartridge respirator.
ist removing, usually indoors.	
washing, usually indoors.	
ing, usually indoors.	
creasing, usually indoors.	

11.4 Acid gases and mists.

JOB	PROTECTIVE DEVICES
ding (indoors)	(1) Mist respirator. (2) Chemical cartridge respirator.
ding (indoors)	
ding (indoors)	

11.5 Alkali mists.

JOB	PROTECTIVE DEVICES
ding (indoors)	(1) Mist respirator. (2) Chemical cartridge respirator.
ding (indoors)	
ding (indoors)	

11.6 Varying atmospheres.

JOB	PROTECTIVE DEVICES
	(1) Nese mask. (2) Oxygen-breathing mask. (3) All-service mask.

11.7 *Air supply for air-line masks of all kinds.*—Air at comfortable temperature and free from odors and excessive moisture sometimes is difficult to furnish, especially

for outdoor jobs in winter. Air quality and temperature shall be tested by the Safety Department and shall meet the suggestions of the American Standard Safety Code for air-supplied respirators (sec. 10.3a).

H-12. Sterilization of Respirators

12.1 Each worker who needs a respirator should be assigned his own respirator. Where this is not done, it is important that the respirator be sterilized in addition to being changed. Adequate sterilization may be accomplished by—

a. Washing the rubber and metal parts with soap, a brush and warm water, after which the respirator is sterilized by immersion for 10 minutes in a solution of formalin made by placing one part of 40% formaldehyde solution into nine parts of water.

b. Washing the rubber and metal parts with soap and warm water, after which the respirator is sterilized by dipping in 3% solution of carbolic acid, a 2% solution of lysol, or a 70% solution of denatured alcohol.

c. Subjecting the respirator to sterilization by a moist atmosphere of antiseptic gas, preferably formaldehyde, for a period of ten minutes at room temperature.

d. After following any one of the outlined procedures, the respirator should be rinsed with water and hung up to dry. The respirator should not be used until it has been dried thoroughly.

e. The filters, felt screens, and elastic headbands should be removed, if detachable, before washing or sterilization of the respirator, unless it is evident that washing and sterilization will not harm these parts.

12.2 The National Safety Council has issued an Industrial Data Sheet No. D-Gen. 16, "Cleaning and Sterilizing Goggles and Respiratory Equipment."

H-13. A Guide for Prevention of Industrial Disease

13.1 Eight common types of disease and methods for their prevention are given in the following sections. Help in applying these methods will be given by the local Safety Department and by safety and medical consultants of the Navy Department and the Maritime Commission.

13.2 Flashburns and foreign bodies in the eye.

a. Effects on workers: "Flash" is a surface eye burn resulting from even momentary unprotected exposure to the welding arc. In this condition the eye is painful and sensitive, especially to light. An eye flash shall be treated only by the doctor or by methods he has prescribed.

b. Foreign bodies in the eye shall be removed only under the doctor's orders or by methods he has prescribed. Like flashburns, they are preventable.

c. For safe practice:

All workers:

1. Whenever near welding areas wear antiflash goggles which have been approved by the Safety Department.
2. Wear safety goggles when grinding, chipping, buffing, scratch-brushing, or forging.

Welders:

3. Wear approved antiflash goggles even when helmet is being worn.
4. Use portable screens to protect the eyes of fellow workers.

13.3 Lead poisoning.

a. Sources: In general, any job in which dust, fume, or smoke from any substance containing lead is breathed daily.

b. For example:

JOB:	WHEN MATERIAL IS:
Welding	Metal, coated with paint
Cutting	containing lead
Burning	Lead
Shrinking	Lead pigments
Grinding	
Buffing	
Spray painting	
Mixing paint pigments	

c. Job can be done safely with:

1. (a) Special ventilation: Use a local exhaust hood approximately 8 inches from the job and drawing at least 200 c. f. m. into the hood with filtration of the discharge, or discharge, to a place where the contaminated air will

- (c) wearing of supplied air respirator.
2. Periodic medical examination which includes blood and urinalyses.

13.4 Solvent vapors.—

a. Sources: In general, any job in which solvent vapors are breathed. For example:

Spray painting.
Painting.
Using paint remover.
Applying cements.
Paint brush and spray gun cleaning.

b. Job can be safely done with:

1. Segregation of such work, and
2. (a) Special ventilation as may be required.
- (b) Provision of spray booths with exhaust system.
- (c) Wearing of special respirators:
 - (1) For spray painting: Supplied air respirators or air line hoods.
 - (2) For other jobs: Chemical cartridge respirators.

(See H-10 on respiratory protective equipment.)

13.5 Zinc fume fever (zinc chills or shakes).—

a. Sources: In general, any job in which the fumes from heated zinc are breathed. For example:

JOB:	WHEN MATERIAL IS:
Welding	Galvanized metal
Cutting	Zinc
Shrinkling	Zinc alloy
Pouring zinc alloys	Brass

b. Job can be safely done with:

1. Special ventilation: Local exhaust hoses or hoods located close enough to operation at all times to remove smoke completely.
2. Wearing of special respirators.

NOTE.—There are no known cumulative effects from zinc chills.

13.6 Fiberglas.—

a. Effects on workers: Men working with Fiberglas may develop a dermatitis or conjunctivitis which are skin and eye conditions. It is best to transfer to another job those who continue to be sensitive.

1. Both experimental and practical evidence show conclusively that the inhalation with Fiberglas causes no lung damage.
2. The cement used with Fiberglas may contain a toxic solvent such as carbon tetrachloride (CCl₄) which can cause severe illness or even death if the cement is used indoors with inadequate ventilation.

b. For safe practice:

1. Clothing: Supply loose coveralls with collars and sleeves buttoned over cheesecloth.
2. Goggles: Should be worn.
3. Shower: Should be taken rather than bath, at end of shift.

Respirators are usually not necessary, but if a cement containing a toxic solvent is used, proper protection either by ventilation or by a respirator must be supplied and used.

13.7 Asbestosis.—

a. Sources: In general, any job in which asbestos dust is breathed. For example:

JOB:	WHEN MATERIAL IS:
Handling	Asbestos
Sawing	Asbestos mixtures
Cutting	
Molding	
Welding rod salvage	

b. Job can be done safely with:

1. Segregation of dusty work and,
2. (a) Special ventilation: Hoods enclosing the working process and having linear air velocities at all openings of 100 feet per minute, or
- (b) Wearing of special respirators.
3. Periodic medical examination.

13.8 Silicosis.—

a. Sources: In general, any job in which the dust of free silica (sand) is breathed daily. For example:

JOB:
Sand-blasting
Sand packing of pipes
Shot blasting of castings

1. Isolation of dusty process and, in addition,
2. Special ventilation: In the case of sand-blasting, the work should be done in the standard type of sand blast room, cabinet, or machine.
3. Special respirator for dust-containing free silica.
4. Periodic examination by doctor.

13.9 Dermatitis.—

a. Sources: Excessive or improper use of cleaning agents such as gasoline. It is not at all uncommon to find dermatitis caused by excessive use of common soaps such as those used in laundering. Cutting oils, certain greases, certain insulating materials used on electric cables and conduits can cause dermatitis.

b. Job can be done safely with:

1. Precautions against excessive use of the causative agent.
2. Advice of the medical department in the use of protective salves and creams.

H-14. Ventilation Standards

14. The maintenance of proper working conditions shall be the responsibility of the safety department, whose staff shall work in close cooperation with the welding, paint, and electrical departments. Air analyses and tests shall be made by the safety and medical consultants of the Navy Department and the Maritime Commission as may be needed.

14.1 Ventilation is required to control temperature and to remove air impurities, as from welding and paint spraying.

14.3 Personnel of Department.—

a. Number:

1. The size of the ventilation crew will vary with the type of ship, equipment available, etc. The head of the safety department will be responsible for the organization of the safety department or division.
2. There shall be a ventilation supervisor on each shift responsible to the head of the safety department. Under the supervisor there shall be a sufficient crew to inspect and maintain good working conditions.
3. An EC-2 ship shall have at least one ventilation man aboard. Larger ships, or ships like carriers with considerable galvanized welding, shall have at least two ventilation men.
4. The number of ventilation men on the night shift shall be in proportion to the construction crew.
5. The ventilation crew must have available a maintenance and repair crew of sufficient size to keep equipment on the job and operating efficiently. Long waits during which equipment is idle must be avoided.

b. Training:

1. The ventilation supervisor (that is, the safety engineer) shall be trained to handle the entire ventilation program in the yard. Local educational institutions, State Industrial Hygiene Units, Maritime Commission engineers, and other sources are available to give this training.
2. The ventilation supervisor shall organize classes, demonstrations, and short talks on standard procedures for ventilating specific spaces on the ships.

14.4 Type of equipment needed.—In ship construction, two types of ventilation are used—local exhaust as for removal of welding fumes at the point of origin, and general ventilation to supply fresh air to confined working spaces.

a. Local exhaust:

1. A common length for a local exhaust hose is forty feet. In ordering exhaust fans for use with local exhaust hoses, the following specifications should be met: Capable of drawing a minimum of 200 c. f. m. through each of 3-inch (or 4-inch) diameter flexible hose. Fans should have provisions for attaching three or more local exhaust hoses per unit.
2. In the interests of power economy, it is undesirable to move much more than 200 c. f. m. through each local exhaust hose.

b. General ventilation:

1. It is frequently desirable to introduce air into

large working spaces such as deep tanks, fore- or after-peaks. This is done in many yards by using a flexible fabric duct, with metal elbows, and a fan of about 5,000 c. f. m. capacity.

It is desirable sometimes to supply a quantity of fresh air into the double bottom. Here a 2,000 c. f. m. unit may be used.

3. These two examples represent the two extremes of this type of work, and therefore are the two extremes in fan sizes. Fan static pressures in each case should exceed four inches of water.

4. For general ventilation of a ship engineroom during construction, a 10,000 c. f. m. blower is recommended. On the other hand, operations in confined quarters where heat is generated (plate shrinking, for example) may use a small portable fan to circulate the air. For this purpose, small blowers of from 800 to 1,500 c. f. m. shall be provided.

c. Ventilating procedures:

1. Local exhaust shall be used whenever a welding operation is being conducted in a confined space, or whenever galvanized metal is being welded. Local exhaust is always a suction process. Never blow a stream of air upon a welding arc.

2. Many welders think that it is enough to hold the end of the suction hose in the same compartment with the welding operation. This is not so. In order to capture the welding fumes, the end of the hose must be within six or eight inches of the arc, assuming a 200 c. f. m. volume per hose. Beyond this distance, the suction hose is ineffective.

3. The air supply to a general ventilation fan must be fresh outside air. Recirculation of air already contaminated shall not be permitted. A minimum of 400 c. f. m. per welder shall be applied to a given working space such as a deep tank when general ventilation is used alone.

In warm weather, air movements or drafts are helpful, while in cold weather a minimum of air movement is desired and local exhaust will serve best. In temperate weather, it is most satisfactory to use a combination of local exhaust and general ventilation.

14.5 Coordination of department with construction program—

a. The ventilation supervisor shall keep abreast of construction, and thus anticipate the ventilation needs.

b. The construction foremen shall inform the ventilation department of ventilation needs before the needs occur.

c. Blackboards, boxes, signal lights, or similar devices shall be installed on board and used to inform the ventilation department of immediate needs.

14.8 Supplementary ventilating procedures.—

a. Ventilating confined spaces, such as the fore- or after-peaks and deep tanks, is greatly simplified by the temporary removal or cutting through of certain plates.

b. For example, the fore-peak of a Liberty ship can best be ventilated by cutting a combination access and ventilation hole through the watertight bulkhead near the ship's bottom.

c. The tank top can be left off of the midship deep tanks until all welding has been completed in this space.

d. A side plate can be left or cut out of the engineroom at the bottom deck level.

5-9. Welding—Arc

9.1 All welders shall be made familiar with the hazards of their work and instructed in safe methods of performing the various types of jobs to which they are assigned.

9.2 Personal protection equipment used by welders shall include:

9.21 Welders' protective hood provided with the proper shade of filter type lens for protection against the harmful rays of the arc and a clear cover glass to protect the filter lens.

(a) The shades or their equivalent recommended are:

Up to 30 amperes—No. 6-7 Shade.

30 to 75 amperes—No. 8 Shade.

75 to 200 amperes—No. 10 Shade.

200 to 400 amperes—No. 12 Shade.

Over 400 amperes—No. 14 Shade.

(b) Shades may also be selected from the following table:

Rod diameter	Welding glass shade No.
1/16	10
3/32	10
1/8	12
5/32	10
3/16	12
7/32	12
1/4	12
5/16	14
3/8	14

(c) The welder's hood should be inspected at least weekly to detect possible light leaks, cracked protective glass, or badly fouled or missing cover glasses. Any defects discovered shall be corrected at once.

American Industrial Hygiene Association News of Local Sections

Metropolitan New York Section

THE regular meetings of the Metropolitan New York Section have included a number of subjects of general interest presented by men with much specific information concerning them. In discussing the subject "Hand Cleansers," DR. A. G. CRANCH, Director of the Industrial Toxicology Department, Union Carbide & Carbon, pointed out that the hand cleansers required depended upon the nature of the soiling material. Solvents, mineral abrasives and strong alkaline solutions are objectionable materials for hand

Limited use of solvents, abrasives like corn meal, non-alkaline soaps made from higher fatty acids are among the more desirable materials to be used. Adequate washings with cleansers and protective preparations decrease industrial dermatitis. It is important to note that many so-called cases of industrial der-

matitis Accidents" was the subject presented at the January meeting by DR. SAMMY KING, Assistant Professor of Physiology, College of Physicians and Surgeons.

The February meeting took the form of a round-table discussion concerning industrial hygiene hazards introduced by the production of war materials. The principal sub-topics discussed were solvents, synthetic products, anti-oxidants, lubricants, catalysts and insecticides. This round-table discussion was led by ROY S. BONSH, Chairman of the Section, and an active part was taken by F. W. CUMMER, G. E. FERGUSON, H. SEAGRAVE, DR. R. P. SIM and DR. A. G. CRANCH. The subject of the proper labeling of solvents received particular attention.

The March 31 meeting was addressed by LIEUT. COMDR. G. E. TWINING, USN, Safety Engineer, United States Navy Yard, Brooklyn, N. Y., on the subject of Ventilation of Weld-

New York. Section are ROY S. BONSH, Chairman, A. G. CRANCH, Vice-Chairman, MORRIS R. JACOBS, P.E.D. Secretary-Treasurer, F. J. PATTY and WILLIAM J. BURKE, Councilors. J. WM. FERNEL, W. R. STEWART, G. E. FERGUSON and W. R. BRADLEY were appointed to the Program Committee, and F. A. PATTY and S. MOSKOWITZ to the Entertainment Committee.

Michigan Section

THE Michigan Industrial Hygiene Society has introduced a mimeographed news letter for its members, the first issue of which has appeared and is full of interest.

At the February meeting, the Michigan Section was addressed on the subject "Women in Industry" by MRS. MARGARET T. METTERT, Women's Bureau, U. S. Department of Labor and MISS IVA WAIT, A. C. Spark Plug Division, General Motors Corporation at East Lansing, Michigan. On March 10, W. P. YANT, Mine Safety Appliances Company, discussed "New World-Wide Industrial Hygiene Problems" following his recent survey of industry in Finland.