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Your Association presents to the industry herewith the first part of the 7th and latest code of recommended practices for foundry safety and hygiene, never before published. Like all the other codes, it was prepared by the A.F.A. Industrial Hygiene Codes Committee, under chairmanship of Jas. R. Allan. The code also is available in pamphlet form.

A.F.A. Code of Recommended Practices for Industrial Housekeeping and Sanitation

THIS code of recommended good practices for industrial housekeeping and sanitation has been developed by a committee of the American Foundrymen's Association to cover the necessary engineering data and requirements for industrial housekeeping and sanitation, including wash, locker, rest, toilet and lunch room facilities for gray iron, malleable iron, steel and non-ferrous branches of the foundry industry, and has been approved by the Board of Directors of A.F.A.

Many foundries have, in addition to casting cleaning departments, pattern, machine and maintenance departments which are considered integral parts of the foundry operation. Also, in many instances there are additional departments wherein further operations are carried on in the processing of materials where this code may be applied.

The introduction of a large percentage of female workers in industry, due to the war, has brought some problems that have not heretofore been of any magnitude.

Therefore, this code will provide the industry with sufficient data for the minimum requirements of housekeeping and sanitation facilities for both male and female employees.

The technical committee which prepared this code, known as the American Foundrymen's Association Industrial Hygiene Codes Committee, is composed of the following:

Chairman, Jas R. Allan, International Harvester Co., Chicago.
S. B. Hansen, International Harvester Co., Chicago.
E. O. Jones, Belle City Malleable Iron Co., Racine, Wis.
H. G. Gregg, Dodge-Chicago Plant, Chrysler Corp., Chicago.
C. P. Guion, W. W. Sly Mfg. Co., Chicago.
T. C. Hermann, Claude B. Schneible Co., Detroit.
C. F. Larsson, American Air Filter Co., Chicago.
S. McMullan, Western Electric Co., Cicero, Ill.
Nathan Lesser, Deere & Co., Moline, Ill.
R. W. McCandlish, Research Corp., Chicago.
R. B. Parker, American Brake Shoe & Foundry Co., New York.
B. A. Parks, Crane Co., Chicago.
John F. Tobin, American Blower Corp., Chicago.
Secretary, H. Hanson (Miss), American Foundrymen's Association, Chicago.
Conferees: L. C. Stokes, Dept. of Labor, State of Illinois, Chicago.
L. H. Streb, Dodge-Chicago Plant, Chrysler Corp., Chicago.

Section I—Scope

This recommended good practice code describes the necessary fundamental engineering and construction information for the layout, design, installation and maintenance of wash, locker, rest, toilet and lunch rooms and general industrial housekeeping and sanitation facilities for the protection of health and safety of persons and the promotion of good industrial relations.

Section II—Requirements

(A) Minimum

When the word "minimum" is used or implied, or when specific figures are used, it shall be understood that there is no limit as to how much the minimum or specific figures may be exceeded to accomplish the desired result.

Section III—Definitions

(A) "Foundry"

"Foundry" shall mean a building or group of buildings used for the production and processing of ferrous and non-ferrous castings.

(B) Foot Candle

A foot candle means the amount of illumination at a point on a plane 1-foot distant from a source of 1-candle power and perpendicular to the light rays at this point.

(C) Mechanical Air Supply

Mechanical air supply shall mean a system of ventilation where the air is taken from the out-of-doors and forced into the room or work place by power driven mechanical equipment combined with the removal or exhaust of air from the room or work place through windows, doors, skylights, transoms, shafts, ducts, ventilating and other openings and/or a mechanical exhaust system, and such air so supplied shall be tempered and distributed in such room or work place as not to cause discomfort to the employees except that, when a mechanical ventilating system or air-conditioning system is used, not more than two-thirds of the mechanically supplied air to the room or work place may be recirculated, provided means are employed to control the temperature, humidity, odors and dusts, and such quantities of recirculated air may be considered as mechanically exhausted from such room or work place, except that no air shall be recirculated from any toilet, wash, locker, rest room or kitchen, or from any other room where such air might be contaminated by smoke, gases or dusts that might be noxious, dangerous or detrimental to the health of employees.

(D) Mechanically Exhausted

Mechanically exhausted shall mean a system of ventilation where air is mechanically removed from the room or work place by means of power, and discharged out of doors in such a manner that the exhausted air cannot re-enter the room or work place or adjacent buildings combined with a supply of air through windows, doors, skylights, transoms, and ventilating and other openings and/or a mechanical air supply system, except that, where a mechanical ventilating system or air-conditioning system is used, not more than two-thirds of the mechanically exhausted air may be recirculated provided means are employed to control the temperature, humidity, odors and dusts, and such quantities of recirculated air may be considered as mechanically exhausted in such room or work place, except that no air shall be recirculated from any toilet, wash, locker, rest room or kitchen, or from any other room where such air might be contaminated by smoke, gases or dusts that might be

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(E) Natural Ventilation

Natural ventilation shall mean a system of ventilation, the effectiveness of which depends upon natural atmospheric conditions and upon the operation of windows, doors, ventilating and other openings, which are in the control of the person or persons in the room or work place.

(F) Net Open Area of Windows, Ventilating Openings, etc.

The net open area of windows and ventilating openings shall mean that the net open area that such windows and ventilating openings can be opened to the out-of-doors.

(G) Projected Area of Doors, Windows and Other Openings

The projected area of doors, windows and other openings shall mean the gross area of the openings provided in the out-of-doors surfaces of the building for such openings.

Section IV—Housekeeping

(A) Housekeeping

Plants, in order to provide reasonable protection for the health and safety of persons employed, shall be maintained in a clean and sanitary manner.

(B) Storage

All products, supplies and materials, parts or equipment, such as castings, pattern and molding equipment, flasks, bottom boards and the numerous other items, shall be stored in places provided for them consistent with efficient operation, and shall be piled or stored in such a manner as not to cause an accident to any employee.

(C) Accumulation of Refuse

Accumulation of refuse and by-products of operations shall not be allowed to the extent that such accumulations would affect the safety or health of workers.

(D) Safe Disposal of Refuse

Combustible or explosive refuse or by-products, or accumulation of waste, sand and other materials, shall be disposed of at least daily in a safe manner in order to eliminate exposures to fire, accident and health hazards.

(E) Conditions of Floors

All floors used by employees shall be maintained in good repair. All aisles, gangways and passageways regularly used by employees shall be maintained in good repair and shall be kept free of obstructions to prevent employees from tripping and falling.

(F) Care of Floors

The floors of all buildings in which employees work shall be maintained in a clean condition and, as far as possible, in a dry condition, consistent with the type of operations carried on. Where wet processes are regularly carried on, causing wet floor conditions, the floors shall be drained or false floors, platforms, mats or other dry standing places provided.

(G) Sweeping and Cleaning

1. Floors and Gangways:

Floors and gangways shall be kept clean of refuse and sand, and if such floors and gangways are cleaned by the sweeping method they shall be dampened or oiled prior to sweeping, to settle the dust arising from such operations.

2. Cleaning of Buildings and Equipment:

The structural parts of buildings and equipment, as well as fixtures and other contents of the plant, shall be kept sufficiently free from accumulations of dust and dirt so that natural air currents and vibrations in the buildings do not release such accumulations of dust and dirt into the breathing zone. The structural parts of buildings, equipment, fixtures and the like, shall be cleaned in such a manner as to prevent harmful quantities of the dust from contaminating the breathing zone of employees; or respirators shall be furnished to the employees in the affected areas. Major cleaning operations involving the cleaning of building structures shall, as far as practicable, be done outside regular working hours to avoid employees being exposed to heavy concentrations of dust and dirt.

(H) Expectoration

Where cuspidors or receptacles are provided for expectoration, they shall be of such construction that they can be readily cleaned and disinfected; and they shall be cleaned at least once daily, if used, to prevent them from becoming a menace to health.

(I) Eating in Certain Workrooms Prohibited

Employees engaged in non-ferrous melting operations involving the use of lead, zinc, brass and copper, employees working in grinding and polishing rooms on non-ferrous materials containing lead, zinc, brass and copper, employees engaged in painting operations, and employees engaged in any other processes where toxic dusts or fumes can be conveyed to the human system by way of mouth, shall not be allowed to lunch on the job; nor shall milk, soft drinks or coffee be brought to the jobs where such hazardous operations are going on. Employees working in such contaminated areas shall be required to wash before eating and facilities shall be provided such as locker room with benches or a lunch room or other equally suitable place, for the use of the employees for eating purposes.

(J) Smoking

Employees shall not be permitted to smoke in pattern vaults or around woodworking or painting operations or where magnesium casting cleaning operations are performed; nor shall employees working in magnesium casting cleaning operations be permitted to smoke in their shop clothing; nor shall such magnesium casting cleaning workers be permitted around any open flames or anyone smoking.

Section V—Ventilation

(A) Cubic Feet of Air Space per Employee in Working Areas

All work rooms in which employees regularly work, other than rooms used primarily for storage and warehouse purposes, shall have not less than two thousand (2,000) cubic feet of air space per person regularly employed, based on gross cubical contents, provided the

Maintenance of clean, adequate lunchroom facilities is an important phase of employer-employee relations. This air-conditioned cafeteria in the foundry employees service building of Caterpillar Tractor Co., Peoria, Ill., serves wholesome food at low cost in sanitary surroundings.



total projected area of doors and windows opening to the out-of-doors is not less than twelve-and-a-half (12½) per cent of the gross floor area of the work room: otherwise, a system of mechanical air supply shall be provided.

(B) Mechanical Air Supply Requirements in Working Areas

Where there is less than two thousand (2,000) cubic feet of air space per person regularly employed in a work room, or where the total projected area of all doors and windows opening to the out-of-doors is less than twelve-and-a-half (12½) per cent of the gross floor area of the work room, there shall be mechanically supplied an amount of clean tempered air on the basis of one of the two following rules, whichever gives the greatest amount of air supply:

(1) For every one hundred (100) cubic feet of air space or fraction thereof, where the air space per person regularly employed in the work room is less than two thousand (2,000) cubic feet, there shall be supplied two (2) cubic feet of air per minute per person, or—

(2) When the projected area of all doors and window openings to the out-of-doors is less than twelve-and-a-half (12½) per cent of the gross floor area of the work room, there shall be supplied two and four-tenths (2.4) cubic feet of air per minute per person, for each one (1) per cent or fraction thereof the projected door and window openings are less than 12½ per cent.

(C) Ventilation of Office, Toilet, Locker, Rest and Lunch Rooms

All offices, rest, toilet, locker and lunch rooms shall be provided with natural or mechanical ventilation to maintain healthful conditions during periods of occupancy, as per the following requirements:

(1) Rooms with Ventilation to the Out-of-Doors:

If offices, rest, locker and lunch rooms have windows or ventilating openings opening to the out-of-doors, and the net open area of such windows and ventilating openings is not less than five (5) per cent of the gross floor area, no mechanical ventilation shall be required.

(2) Rooms with Ventilation to the Out-of-Doors but with a Deficiency of Natural Ventilation:

If offices, rest and lunch rooms have less than five (5) per cent and more than two-and-a-half (2½) per cent of the gross floor area represented by net windows and ventilating openings opening to the out-of-doors, there shall be provided a mechanical supply of clean tempered air of not less than six-tenths (.6) cubic feet of air space per minute per square foot of gross floor area. However, if the net open area of the windows and ventilating openings opening to the out-of-doors is less than two-and-a-half (2½) per cent of the gross floor area, there shall be mechanically supplied, six-tenths (.6) cubic feet of clean tempered air per minute per square foot of gross floor area and there shall be mechanically exhausted, three-tenths (.3) cubic feet of air per minute per square foot of gross floor area.

(3) Rooms without Ventilating Openings to the Out-of-Doors:

If offices, rest and lunch rooms are located in the interior of buildings and with no direct natural ventilation to the out-of-doors and which have less than five (5) per cent and more than two-and-a-half (2½) per cent of the gross floor area of the room, represented by net window and ventilating openings opening to the buildings in which they are located, and if the net area of all windows and ventilating openings to the out-of-doors of that floor of the building plus the office, rest and lunch rooms is not less than five (5) per cent of the gross floor area, no mechanical ventilation shall be required. However, if the net open area of all windows and ventilating openings to the out-of-doors on the floor of the building containing office, rest and lunch rooms is less than five (5) per cent of the gross floor area of the floor of the building including office, rest and lunch rooms, then there shall be mechanically supplied not less than one (1) cubic foot per minute of clean tempered air per square foot or gross floor area to such office, rest and lunch rooms, and there shall be mechanically exhausted one (1) cubic foot of air per minute per square foot of gross floor area.

(4) Kitchens:

Where a room is used for kitchen purposes only, for the preparation of food for employees, there shall be mechanically exhausted four (4) cubic feet of air per minute per square foot of gross floor space, and if the net open area of windows and ventilating openings opening to the outside is less than three (3) per cent of the gross floor area of such kitchen, there shall also be mechanically supplied one and two-tenths (1.2) cubic feet per minute of clean tempered air per square foot of gross floor area.

(5) Toilet and Locker Rooms:

If the amount of net open area of windows and ventilating openings opening to the out-of-doors is less than five (5) per cent of the gross floor area of toilet and locker rooms, there shall be mechanically exhausted one and five-tenths (1.5) cubic feet of air per minute per square foot of gross floor area.

Section VI—Lighting

(A) Lighting Requirements

Where daylight does not provide sufficient illumination, artificial illumination shall be provided in all work areas and other parts of the buildings to which employees are accustomed to having access, to prevent accidents and give reasonable illumination, and such places shall be provided with artificial illumination of not less than the following intensities, measured at floor level, unless otherwise noted:

Rooms and buildings used for storage and stocking of materials, and for warehouse purposes	Not less than 2½-ft. candles
Passageways, aisles and gangways not located in rooms illuminated for other purposes	Not less than 2½-ft. candles
Work places in which employees are engaged in manufacturing and kindred processes	Not less than 10-ft. candles measured at work level.
Boiler and engine rooms	Not less than 5-ft. candles
Electrical sub-stations and switchboard rooms	Not less than 5-ft. candles
Washrooms	Not less than 5-ft. candles
Locker rooms	Not less than 5-ft. candles
Rest rooms	Not less than 5-ft. candles
Toilet rooms	Not less than 5-ft. candles
Rooms used solely for lunch purposes	Not less than 10-ft. candles
Kitchen	Not less than 10-ft. candles
Offices	Not less than 10-ft. candles

Section VII—Water Supply for Human Consumption

(A) Potable Water

A source of potable water shall be supplied for all purposes for human consumption, such as for drinking, cooking, washing and bathing purposes.

(B) Water for Washing and Bathing

A supply of cold and hot water shall be provided for all lavatories and shower baths installed. The temperature of the hot water shall be controlled to prevent scalding the employees, or hot and cold water shall be provided through double faucets or valves having a single discharge.

(C) Provision for Drinking Water

A supply of potable and cool drinking water shall be provided and made accessible to employees in working areas; also a supply of drinking water shall be provided in all rooms assigned for lunch purposes. No drinking water facilities shall be provided in toilet rooms and privies.

(D) Method of Dispensing Drinking Water

(1) Drinking Cups:

The use of common drinking cups is prohibited. However, individual paper drinking cups may be used, and

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a container shall be provided for the discarded cups. A container shall be provided for unused individual cups to protect them from dirt and soil before use.

(2) Drinking Fountains:

Where a drinking fountain is provided it shall be constructed of impervious material with the water jet set at an angle, protected with a guard so that the water cannot fall back into the point of discharge. The nozzle or water jet shall be located at least three-quarters (¾) of an inch above the edge of the bowl or receptor, and the discharge nozzle shall be guarded so that the mouth or nose of the drinker shall be prevented from coming in contact with the discharge nozzle. The bowl or receptor shall be so proportioned as to catch all water issuing from the nozzle, and there shall be provided a waste pipe sufficiently large to carry off water promptly from the bowl and adequately trapped. The height of the drinking level of the fountain shall be convenient to the average person.

(3) Other Methods of Supplying Drinking Water:

Open containers such as barrels, pails or tanks for drinking water purposes from which water must be dipped, poured, whether fitted with cover or not, shall not be used, except that drinking water for mobile labor gangs such as labor construction crews, building crews and the like, may be supplied with portable pressure drinking fountains equipped with approved water jet as described in paragraph D (2) of this section, and thermos bottles may be used for drinking water for individual use by employees in remote and isolated places such as crane cabs and the like.

[E] Posting of Notices of Unsafe Water

Where water is not potable or fit for human consumption, and is used for industrial processes, fire protection and the like, notices shall be posted at all water outlets where the water might be used for human consumption, stating clearly that such water is unsafe and not to be used for drinking purposes.

[F] Cross Connections

There shall be no physical cross connections of contaminated water systems with potable water systems within the plant property. Valves and check valves shall not be considered a means of separating a contaminated water supply from a potable water supply.

[G] Back Siphonage

No potable water supply system shall be connected to any tank, plumbing or other fixture or device where back siphonage may occur to contaminate the water system except in the following manner:

(1) Lavatories and Sinks:

Where potable water supply system is used for washing and bathing purposes the outlet of the faucets or the water supply to such lavatories and sinks shall not be less than one (1) inch above the rim.

(2) Toilets and Urinals:

No potable water system shall be connected to a toilet or urinal except by means of a back flow preventer provided with the flush valve, or by means of a gravity flush tank where the outlet of the potable water system to such tank or the critical level of a back flow preventer is at least one (1) inch above the overflow and such overflow shall be capable of handling the maximum flow of water without the water level in the tank reaching the supply outlet or critical level.

(3) Other Equipment:

No potable water supply shall be directly connected to a water system used for purposes that might contaminate the potable water system due to back siphonage, such as aspirators, syphons, ejectors, washers, processing tanks and the like. When water is required for other than potable use and the water supply is obtained from a potable water supply system, such requirements shall be taken from a surge tank which is supplied by the potable water system with the potable water supply pipe discharging not less than the equivalent to two (2) nominal supply pipe diameters and never less than six (6) inches above the rim of such surge tank.

(Part 2 of this code of recommended practices for foundry safety and hygiene will appear in the January issue of "American Foundryman.")

Bulletin on Training Women for War Work

AS THE deeper draft of manpower daily brings more women into war production work, the Apprentice-Training Service, War Manpower Commission, under the guidance of Wm. F. Patterson, Director, has issued the bulletin "Training Women for War Work."

While the training methods suggested for inexperienced women workers do not differ from the recommended procedure for inexperienced male employees, additional practice and explanation is recommended to compensate for the lack of mechanical knowledge and industrial experience prevailing among women employees.

The manual of training procedures, therefore, is based on special studies of job training for women and on reports from Apprentice-Training Service field men on the training practices which are being applied successful by war production plants. Copies of the booklet may be had by writing to Apprentice-Training Service, War Manpower Commission, Washington, D. C.



Another A.F.A. Company member received the Army-Navy "E" award for excellence in war production when Minneapolis Electric Steel Castings Co., Minneapolis, was presented with the coveted flag at plant ceremonies, October 2d. At left, holding banner, is S. V. Wood, president of the company, and a National Director of the Association.