

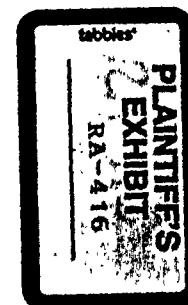
STATE OF OHIO



**Legal Requirements
for the
Prevention and Control
of
Industrial Public Health Hazards**

Division of Industrial Hygiene
OHIO DEPARTMENT OF HEALTH
Columbus, Ohio
1946

Q Q Q




P. J. Moore Printing Company
Columbus, Ohio
1941

INTRODUCTION

This monograph has been prepared by the Division of Industrial Hygiene of the Ohio Department of Health for the purpose of making available to industrial establishments, physicians and others, the laws of Ohio concerning employments which in whole or in part are administered by the Department of Health and the regulations of the Ohio Sanitary Code concerning industrial public health hazards which, by order of the Director of Health, are to be administered by the Division of Industrial Hygiene.

The statutes included are those relating to the reporting of occupational diseases to the Department of Health and the procedures to be followed; those relating to the manufacture of lead and prescribing the responsibilities of employer and employee; and the authority of the Department to extend the list of employments prohibited to minors.

The regulations included are those relating to the use of mercurial coral in batteries for, adopted October 28, 1940, and for the recognition, prevention and control of diseases or ailments resulting from exposure to toxic dusts, fumes, mists, vapors and gases.

Additional information may be had by addressing the Division of Industrial Hygiene, Ohio Department of Health, 63 South Front Street, Columbus 15, Ohio.

INVESTIGATION OF VIOLATIONS

Sec. 1236-3. (Right of entry to investigate violations.) The commissioner of health and any person authorized by him as to do may, without fee or hindrance, enter, examine and survey all grounds, vehicles, apartments, buildings and places within the state in furtherance of any duty laid upon the state department of health or where he has reason to believe there exists a violation of any health law of this state or of any provision of the sanitary code (107 v. 324.)

REPORTS OF OCCUPATIONAL DISEASES

Sec. 1243-1. (Reports of occupational diseases and ailments; when and by whom made.) Every physician in this state attending on or called in to visit a patient whom he believes to be suffering from poisoning from lead, phosphorus, arsenic, brass, wood alcohol, mercury or their compounds, or from anthrax or from compressed air illness and such other occupational diseases and ailments as the state department of health shall require to be reported, shall within forty-eight hours from the time of first attending such patient send to the state commissioner of health a report stating:

- (a) Name, address and occupation of patient.
- (b) Name, address and business of employer.
- (c) Nature of disease.
- (d) Such other information as may be reasonably required by the state department of health.

The reports herein required shall be made on, or in conformity with the standard schedule blanks hereinafter provided for. The mailing of the report, within the time required, in a stamped envelope addressed to the office of the state commissioner of health, shall be a compliance with this section. (108 v. Pt. 2, 1129.)

Sec. 1243-2. (Blanks for reports.) The state department of health shall prepare and furnish, free of cost, to the physicians included in the preceding section, standard schedule blanks for the reports required under this act. The form and contents of such blanks shall be determined by the state department of health. (108 v. Pt. 2, 1129.)

Sec. 1243-3. (Such reports not evidence.) Reports made under this act shall not be evidence of the facts therein stated in any action arising out of the disease therein reported. (103 v. 135.)

Sec. 1243-4. (Reports to be made by state department of health to department of industrial relations.) It shall furthermore be the duty of the state department of health to transmit a copy of all such reports of occupational disease to the proper officer in charge of factory inspection. (108 v. Pt. 2, 1130.)

RESTRICTION ON EMPLOYMENT OF MINORS

Sec. 13003. (Board shall determine whether particular employment of minors shall be prohibited.) The state board of health may, from time to time, after a hearing duly had, determine whether or not any particular trade, process of manufacture or occupation in which the employment of children under the age of sixteen years is not already forbidden by law, or any particular method of carrying on such trade, process of manufacture or occupation, is sufficiently dangerous to the lives or limbs or injurious to the health or morals of children under sixteen years of age to justify their exclusion therefrom. No child under sixteen years of age shall be employed, permitted or suffered to work in any occupation thus determined to be dangerous or injurious to such children. There shall be a right of appeal to the common pleas court from any such determination. (103 v. 910.)

Sec. 13007-4. (Board may determine whether employment of children shall be prohibited in certain occupations.) The state board of health may, from time to time, after hearing duly had, determine whether or not any particular trade, process of manufacture or occupation, in which the employment of children under eighteen years of age is not already forbidden by law, or any particular method of carrying on such trade, process of manufacture or occupation, is sufficiently dangerous to the lives or limbs or injurious to the health or morals of children under eighteen years of age to justify their exclusion therefrom.

No child under eighteen years of age shall be employed, permitted or suffered to work in any occupation thus determined to be dangerous or injurious to such children. There shall be a right of appeal to the common pleas court from any such determination. (103 v. 911.)

MANUFACTURE OF LEAD

Sec. 6330-1. (General duties of employers.) Every employer shall, without cost to the employee, provide such reasonably effective devices, means and methods as shall be prescribed by the industrial commission of Ohio, to prevent the contraction by his employees of illness or disease incident to the work or process in which such employees are engaged. (109 v. 181.)

Sec. 6330-2. (Especially dangerous works or processes.) Every work or process in the manufacture of white lead, red lead, litharge, sugar of lead, arsenate of lead, lead chromate, lead sulphate, lead nitrate or ammoniate, is hereby declared to be especially dangerous to the health of the employee, who, while engaged in such work or process, are exposed to lead dusts, lead fumes, or lead solutions. (103 v. 819.)

Sec. 6330-3. (Duties of employers to provide safety appliances for the protection of employees in especially dangerous works or processes.) Every employer shall, without cost to the employee,

provide the following devices, means and methods for the protection of his employees who while engaged in any work or process included in section 2,* are exposed to lead dusts, lead fumes or lead solutions:

(a) (Working rooms.) Working rooms, hoods and air exhausts for the protection of employees engaged in any work or process which produces lead dusts or lead fumes. The employer shall provide and maintain work rooms adequately lighted and ventilated, and so arranged that there is a continuous and sufficient change of air, and all such rooms shall be fully ventilated and separated by partition walls from all departments in which work or process is of a non-dusty character; and all such rooms shall be provided with a floor permitting an easy removal of dust by wet methods or vacuum cleaning, and all such floors shall be so cleaned daily.

Every work or process referred to in section 2,* including the corroding or oxidizing of lead, and the crushing, mining, sifting, grinding and packing of all lead salts or other compounds referred to in section 2,* shall be so conducted and such adequate devices provided and maintained by the employer as to protect the employee, as far as possible, from contact with lead dust or lead fumes. Every kettle, vessel, receptacle or furnace in which lead in any form referred to in section 2,* is being melted or treated, and any place where the contents of such kettles, receptacles or furnaces are discharged, shall be provided with a hood connected with an efficient air exhaust; all vessels or containers in which dry lead in any chemical form or combination referred to in section 2,* is being conveyed from one place to another within the factory shall be equipped at the place where the same are filled or discharged, with hoods having connection with an efficient air-exhaust; and all hoppers, chutes, conveyors, elevators, separators, vents from separators, dumps, pulverizers, chasers, dry-pans or other apparatus for drying pulp lead, dry-pan dump, and all barrel packers and cars or other receptacles into which corrosives are at the time being emptied shall be connected with an efficient dust-collecting system; such system to be regulated by the discharge of air from a fan, pump, or other apparatus, either through a cloth dust-collector having an area of not less than one-half square foot of cloth to every cubic foot of air passing through it per minute, the dust-collector to be placed in a separate room which no employee shall be required or allowed to enter, except for essential repairs, while the works are in operation; or such other apparatus as will efficiently remove the lead dusts from the air before it is discharged into the outer air.

(b) (Washing facilities.) The employer shall provide a wash room or rooms which shall be separate from the work rooms, be kept clean, and be equipped with:

(1) Lavatory basins fitted with waste pipes and two jets of water conveying hot and cold water, or

* Section 2 is G. C. section 6330-2

(2) Basins placed in troughs [troughs] fitted with waste pipes and for each basin two spigots conveying hot and cold water, or

(3) (Basins.) Troughs of enamel or similar smooth impervious material fitted with waste pipes, and for every two feet of trough length two spigots conveying hot and cold water.

Where basins are provided there shall be at least one basin for every five employees, and where troughs are provided, at least two feet of troughs for every five such employees. The employer shall also furnish nail brushes and soap, and shall provide at least three clean towels per week for each such employee. A time allowed of not less than ten minutes, at the employer's expense, shall be made to each such employee for the use of said wash room before the lunch hour and at the close of the day's work.

(4) (Shower bath.) The employer shall also provide at least one shower bath for every five such employees. The baths shall be approached by wooden runways, be provided with movable wooden gratings, be supplied with controlled hot and cold water, and be kept clean. The employers shall furnish soap, and shall provide at least two clean bath towels per week for each such employee. An additional time allowance of not less than ten minutes, at the employer's expense, shall be made to each such employee for the use of said baths at least twice a week at the close of the day's work. The employer shall keep a record of each time that such baths are used by each employee, which record shall be open to inspection at all reasonable times by the (state department of factory inspection) and also by the (state board of health).

(5) (Dressing Rooms.) The employer shall provide a dressing room or rooms which shall be separate from the work rooms, be furnished with a double sanitary locker or two single sanitary lockers for each such employee and be kept clean.

(6) (Eating Rooms.) The employer shall provide an eating room or eating rooms which shall be separate from the work rooms, be furnished with a sufficient number of tables and seats, and be kept clean. No employee shall take or be allowed to take any food or drink of any kind into any work room, nor shall an employee remain or be allowed to remain in any work room during the time allowed for his meals.

(7) (Drinking Fountains.) The employer shall provide and maintain a sufficient number of sanitary drinking fountains readily accessible for the use of the employees.

(8) (Clothing.) The employer shall provide at least two pairs of overalls and two jumpers for each employee, and repair or renew such clothing when necessary, and wash the same weekly. Such clothing shall be kept exclusively for the use of that employee.

(9) (Respirators.) The employer shall provide, and renew when necessary at least two reasonably effective respirators for each

employee who is engaged in any work or process which produces lead dusts. (103 v. 819)

Sec. 6330-4. (Duties of employee in specially dangerous works or processes to use the safety appliances provided by the employer.) Every employee who, while engaged in any work or process included in section 2,* is exposed to lead dusts, lead fumes or lead solutions, shall:

(a) Use the washing facilities provided by the employer in accord with section 3 (b),** and wash himself at least as often as a time allowance is therein granted for such use.

(b) Use the eating room provided by the employer in accord with section 3 (d),** unless the employee goes off the premises for his meals.

(c) Put on, and wear at all times while engaged in accord with section 3 (f),** and remove the same before leaving at the close of the day's work; and keep his street clothes and his working clothes, when not in use, in separate lockers or separate parts of the locker provided by the employer in accord with section 3 (c).**

(d) Keep clean the respirators provided by the employer in accord with section 3 (g),** and use one at all times while he is engaged in any work or process which produces lead dusts. (103 v. 822.)

Sec. 6330-5. (Notices, printing, posting and explaining same.) The employer shall post in a conspicuous place in every work room where any work or process included in section 2,* is carried on, or in where washing facilities are provided, dressing rooms and eating room. A notice of the known dangers arising from such work or process, and simple instructions for avoiding, as far as possible, such dangers. The (chief state factory inspector) shall prepare a notice containing the provision of this act, and shall furnish, free of cost, a reasonable number of copies thereof to every employee included in section 2,* and the employer shall post copies thereof in the manner hereinabove stated. The notices required in this section shall be printed in plain type on cardboards and shall be in English and in such other languages as the circumstances may reasonably require. The contents of such notices shall be explained to every employee by the employer when the said employee enters employment in such work or process, and in addition shall be read to all employees at least once a month, interpreters being provided by the employer when necessary to carry out the above requirements. (103 v. 822.)

Sec. 6330-6. (Medical examination of employee.) The employer shall cause every employee who, while engaged in any work or process included in section 2,* is exposed to lead dusts, lead fumes

* Section 2 is G. C. section 6330-1

** Section 3 is G. C. section 6330-3

or lead solutions, to be examined at least once a month for the purpose of ascertaining if symptoms of lead poisoning appear in any employee. The employee shall submit himself to the monthly examination and to examination at such other times and places as he may reasonably be requested by the employer, and he shall fully and truly answer all questions bearing on lead poisoning asked him by the examining physician. The examinations shall be made by a licensed physician, designated and paid by the employer, and shall be made during the working hours, a time allowance therefor, at the employer's expense, being made to each employee so examined. (103 v. 822.)

Sec. 6330-7. (Record and reports of medical examination.) Every physician making any examination under section 6,* and finding what he believes to be symptoms of lead poisoning shall enter, in a book to be kept for that purpose in the office of the employer, a record of such examination containing the names and address of the employee so examined, the particular work or process in which he is engaged, the date, place and finding of such examination, and the directions given in each case by the physician. The record shall be open to inspection at all reasonable times by the (state department of factory inspection) and by the (state board of health).

(What reports shall state). Within forty-eight hours after such examination and finding, the examining physician shall send a report thereof in duplicate, one copy to the (state department of factory inspection) and one to the (state board of health). The report shall be upon or in conformity with blanks to be prepared and furnished by the (state board of health), free of cost, to every employer included in section 2,** and shall state:

- (a) Name, occupation and address of employee.
- (b) Name, business and address of employer.
- (c) Nature and probable extent [of] disease.
- (d) Such other information as may be reasonably required by the (state board of health).

The examining physician shall also, within the said forty-eight hours, report such examination and finding to the employer, and after five days from such report the employer shall not continue the said employee in any work or process where he will be exposed to lead dusts, lead fumes or lead solutions, nor return the said employee to such work or process without a written permit from a licensed physician. (103 v. 823.)

Sec. 6330-8. (Enforcement.) The (state department of factory inspection) shall enforce this act and prosecute all violations of the same. The officers, or their agents, of the said (department) shall be allowed at all reasonable times to inspect any place of employment included in this act. (103 v. 823.)

* Section 6 is G. C. section 6330 6.
** Section 3 is G. C. section 6330 3.

Sec. 6330-9. (Penalties for violations by employer or employee.) Every employer, who either personally or through any agent violates or fails to comply with any provision of section 1,* or section 3,** shall be guilty of a misdemeanor, and on conviction for the first offense shall be fined not less than one hundred dollars nor more than two hundred dollars, and on conviction for the second offense, not less than two hundred dollars nor more than five hundred dollars, and on conviction for each subsequent offense, not less than three hundred dollars nor more than one thousand dollars, and in each case he shall stand committed until such fine and the costs are paid, or until he is otherwise discharged by due process of law.

Every employee who violates or fails to comply with any provision of section 4*** shall be guilty of a misdemeanor, and on conviction for the first offense shall be fined not less than ten dollars nor more than twenty-five dollars, and on conviction for the second offense, not less than twenty dollars nor more than fifty dollars, and on conviction for each subsequent offense not less than thirty dollars nor more than one hundred dollars, and in each case he shall stand committed until such fine and the costs are paid, or until he is otherwise discharged by due process of law.

Every employer who, either personally or through any agent, violates or fails to comply with any provision of sections 5, 6, or 7,† relating to him, and every employee who violates or fails to comply with the provision of section 6 relating to him shall be guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten dollars nor more than one hundred dollars. (103 v. 823.)

Sec. 6330-10. ("Employer" defined.) In this act, unless the context otherwise requires, "employer" includes persons, partnerships and corporations. (103 v. 824.)

Sec. 6330-11. (Each section independent.) For the purpose of determining the constitutionality of any provision of this act, section 1,* hereof is declared to be independent of and separable from the remaining sections. (103 v. 824.)

Sec. 6330-12. (Time of taking effect.) This act shall take effect on the first day of October, 1913, except as to subdivisions (a), (b), (c) and (d) of section 3,** which subdivision shall take effect as follows:

Subdivision (b), (c) and (d) of section 3,** on the first day of October, 1914.

Subdivision (a) of section 3,** on the first day of October, 1915 (103 v. 824.)

* Section 1 is G. C. section 6330 1.

** Section 3 is G. C. section 6330 3.

*** Section 4 is G. C. section 6330 4.

† Sections 5, 6, and 7, are G. C. sections 6330 5, 6330 6, and 6330 7.

USE OF MERCURIAL CARROT IN HATTERS' FUR
(Extract from Ohio Sanitary Code.)

Regulation 241. (Definitions.) For the purpose of carrying out the provisions of these regulations the following terms are defined:

Hatters' Fur is any animal fiber or other substance used in the manufacture of hats, which is treated or otherwise prepared by the process of, or in a manner similar to that of carotting.

Carotting is the process of treating hatters' fur with mercury nitrate or any other solution or material for the purpose of rendering the hatters' fur suitable in the manufacture of hats.

Mercurial carrot is any solution or material containing mercury or its compounds in combination with nitric acid or other materials and used in the carotting or preparation of hatters' fur.

Adopted October 18, 1931; filed with Secretary of State November 18, 1931; effective December 1, 1931.

Regulation 242. Effective December 1, 1931, the use of mercurial carrot in the preparation of hatters' fur, or the use of mercurial carotting hatters' fur in the manufacture of hats, is prohibited:

Provided, That any hat manufacturer or fur cutter having mercurial carotting hatters' fur on hand December 1, 1931, may use said fur until it is consumed.

Adopted October 18, 1931; filed with Secretary of State November 18, 1931; effective December 1, 1931.

REGULATIONS FOR THE PREVENTION AND CONTROL OF DISEASES RESULTING FROM EXPOSURE TO TOXIC FUMES, VAPORS, MISTS, GASES AND DUSTS IN ORDER TO PRESERVE AND PROTECT THE PUBLIC HEALTH

Adopted by the Ohio Public Health Council February 16, 1946
Filed with the Secretary of State March 1, 1946
Effective January 1, 1947

Regulation 243. (Application of Regulations.) These regulations shall apply to every place of employment and particularly to those places of employment where a work or process is carried on by which dusts, fumes, mists, vapors, gases or environmental conditions of a harmful nature are produced or generated, or exist independently of the work or process, which may be inhaled or absorbed or in any other manner enter the body in quantities or concentrations that constitute harmful exposure as hereinafter defined.

Regulation 245. (Modifications.) When strict compliance with all of the provisions of these regulations would involve undue hardship, the Ohio Department of Health may, upon application in writing, permit modification of the requirements when protection practically equivalent to that required by these regulations has been provided. The application for the modification of any of these regulations in any particular case shall be accompanied by a full statement of the existing conditions and the reasons for requesting such modification. Any modification granted under the provisions of this paragraph shall be limited to the particular case covered by the application for such modification.

Regulation 246. (Definitions.)

(1) A "Gravity System of Ventilation" means one which depends wholly upon relative air density.

(2) A "Mechanical System of Ventilation" means one which depends upon the operation of power-driven equipment.

(3) "General Ventilation" means the ventilation of the general atmosphere in the place of employment.

(4) "Dilution Ventilation" means ventilation provided to dilute the concentration of dusts, fumes, vapors, or gases in the atmosphere of all or part of the place of employment.

(5) "Local Exhaust Ventilation" means that type of ventilation in which suction is applied at the point of generation or escape of dusts, fumes, mists, vapors or gases.

(6) "Exhaust System" means a complete suction device, including all hoods, ducts, fans, separators, and receptacles when required, and any other part necessary for the proper installation of

(7) "Hood" means that part of an exhaust system into which the contaminated air or dust, fume, mist, vapor or gas first enters. Ordinarily it consists of an enlargement of the end of the duct of such shape and design as to facilitate the entry of dust or other impurities to the exhaust system.

(8) "Duct" means any pipe, flume, or channel, forming a part of a ventilating system, used to convey air, dusts, fumes, mists, vapors, or gases.

(9) "Fan" means the machine which creates the movement of air in a mechanical system of ventilation.

(10) "Separator" means that part of an exhaust system in which the contaminant or entrained material is separated from the air which conveys it.

(11) "Refuse Receptacle" means that part of the exhaust system into which dust or other material separated from the air is deposited.

(12) "Approved" means approved by the Ohio Department of Health.

(13) "Dust" means particles of solid matter that have undergone comminution.

(14) "Fumes" means solid particles generated by condensation from the vapor or gaseous states, usually of metals, and often accompanied by oxidation.

(15) "Mist" means liquid droplets suspended in air.

(16) "Vapor" means the gaseous form of a substance normally in the liquid or solid state.

(17) "Gas" means a formless fluid occupying the space of enclosure.

(18) "Harmful" as applied to the effect of dusts, fumes, vapors, mists, or gases, and any environmental condition, arising from industrial operations or processes means any mechanical or toxic action which in any way injures any part of the body.

(19) An "Isolated Operation" means one which is carried on in a location where, or at such time that, no employee except such as actually engaged in the operation involved is subjected to the harmful exposures resulting therefrom.

(20) "Silica (free or uncombined)" is the name given to the chemical compound silicon dioxide (SiO_2).

(21) "Singular and Plural Number". Whenever in these regulations the singular is used the plural shall be implied and whenever the plural is used the singular shall be implied.

Regulation 217. (Harmful Exposure)

(1) No employer shall use or permit to be used in the conduct of his business, manufacturing establishment or other place of employment, any process, material or condition known to have an ad-

verse effect on health, unless reasonable provisions have been made to prevent injury to the health of the employees and of the public.

(2) The concentration of dusts, fumes, mists, vapors, or gases, in the air breathed by employees shall not exceed the following maximum allowable concentrations for an 8-hour daily exposure:

GASES AND VAPORS

CONCENTRATION Parts per million (by volume)

Acetone	500
Acrokin	0 3
Acrylonitrile (Vinyl Cyanide)	20
Aniline	100
Amyl Acetate	400
Butyl Acetate	400
Ethyl Acetate	400
Aniline	5
Arsine	1
Benzene (Benzol)	100
Butanone (Methyl Ethyl Ketone)	300
Butyl Alcohol	100
Carbon Disulfide	20
Carbon Monoxide	100
Carbon Tetrachloride	100
Chlorine	5
Chloroform	100
Dichlorobenzene	75
Dichloroethyl Ether	15
Dimethyl Aniline	5
Ether (Ethyl)	400
Ethylene Dichloride	100
Ethylene glycol monomethyl ether (Methyl "Cellulosolve")	100
Formaldehyde	10
Hydrogen Chloride	10
Hydrogen Cyanide	20
Hydrogen Fluoride (Calculated as HF)	3
Hydrogen Sulfide	20
Methyl Alcohol	200
Methyl Bromide	20
Methyl Chloride	200
Naphtha:	
Coal Tar	200
Petroleum	1,000
Nitrobenzene	5
Nitrogen Oxides	25
Ozone	1
Phosgene	1
Phosphine	1
Styrene (Monomer)	400
Sulfur Dioxide	10

GASES AND VAPORS—Concluded

	CONCENTRATION Parts per million (by volume)
Tetrachloroethane	10
Tetrachloroethylene (Perchloroethylene)	200
Toluene (Tolual)	200
Trichloroethylene	200
Turpentine	200
Xylene (Xylol)	200

METALLIC DUSTS AND FUMES

	CONCENTRATION Milligrams per cubic meter
Cadmium	0.1
Chromic Acid and Chromates (Calculated as chromic oxide, CrO ₃)	0.1
Lead	0.15
Manganese	6.0
Mercury	0.1
Zinc Oxide	15.0

OTHER DUSTS AND FUMES

Chlorinated Diphenyls	1.4
Chlorinated Naphthalenes: Trichloronaphthalene	3.0
Pentachloronaphthalene	0.3

MINERAL DUSTS

	CONCENTRATION Million particles per cubic foot
Asbestos	5
Silica, free or uncombined: Over 40%	5
20 to 40%	10
10 to 20%	20

RADIATION

X-ray (Roentgens per day)	0.1
Radium (Roentgens per day)	0.1
Radon gas (Curie per liter)	10 ⁻¹¹

***Explanatory Note:**

- (1) At least three atmospheric samples, spaced at intervals to yield an average measurement of exposure over the entire cycle of operation under test shall be collected in the breathing zone of the worker or wherever such exposures are suspected or known to exist.

- (2) The sampling and analysis of contaminated air and the interpretation of the data in relation to the stated maximum allowable concentrations shall be done only by technically qualified and competent persons using methods approved by the Ohio Department of Health.

- (3) Temporary concentrations in excess of the maximum allowable concentrations listed shall not be permitted if exposure to such concentrations for a period of one hour or less may result in an adverse effect on health as determined by the Ohio Department of Health.

- (4) For the purpose of the above maximum allowable concentrations for silica, the free silica content shall be the percent of free silica in the fraction of the air-borne dust in the breathing zone of the worker that is smaller than 5 microns in maximum diameter.

- (5) For all other dust determinations millions of dust particles per cubic foot of air by the light field microscope counting technique shall include all microscopically visible particles up to 10 microns in size.

Regulation 238. (General Ventilation). Special Requirements: Wherever harmful concentration of dusts, fumes, mists, vapors or gases exist, or are produced in the course of the employment, and prevention, elimination, or control of said harmful exposures is not practical by local exhaust, or by other means as hereinafter provided, the capacity of the general ventilation system, be it a gravity or mechanical means of moving air, shall be augmented, or sufficient dilution ventilation provided, so as to provide for the elimination of said harmful exposures to a degree specified under Regulation 247.

Regulation 249. (Local Exhaust Ventilation).

(1) **Where Required:** All equipment and processes that emit or create harmful dusts, fumes, mists, vapors, gases, or other contaminants in quantities that tend to be harmful to the health of the employees exposed thereto, and where general ventilation alone or in conjunction with other provisions of these regulations, is inadequate to furnish the required protection, shall be connected to an exhaust system for the removal of said hazards, as far as practicable at their point of origin. Wherever practicable, application of local exhaust ventilation is preferred.

(2) **General Requirements:** Exhaust fans, ducts, hoods, separators, and all necessary appurtenances including refuse receptacles shall be so designed, constructed, maintained and operated as to insure the required protection in the production of volume and velocity of exhaust air sufficient to gather dusts, fumes, mists, vapors, or gases from said equipment or process and to convey them to suitable points of safe disposal thereby preventing their dispersion in harmful quantities into the atmosphere of work rooms, or other places where persons are employed.

(3) **Duration of Operation:** The exhaust system shall be in operation continuously during all operations which it is designed to serve. If the employee remains in the contaminated zone, the system shall continue to operate for some time after the cessation of said operations, the length of time to depend upon the individual circumstances and effectiveness of the general ventilation system.

(4) Disposal of Exhaust Materials: The air outlet from every dust separator and the fumes, mist, vapors, or gases collected by an exhaust system shall discharge in such a manner that the discharged materials shall not create places of employment in harmful quantities or in concentrations which exceed the maximum allowable concentrations specified in Regulation 217. Dust, and refuse discharged from an exhaust system shall be burned (when feasible), buried, treated, or otherwise disposed of in a manner that will prevent its harmful disposition.

Regulation 250. (Dust Alleviating Media). Use shall be made of water, oil or chemicals in such non-injurious quantities and with such frequency, as may be necessary to suppress and carry harmful dust wherever the provisions of Regulation 217 are impracticable or inadequate to prevent harmful exposure. The use of dust alleviating media may also be supplementary to other provisions of these regulations.

Regulation 251. (Personal Protective Equipment).

(1) When to be Worn: Where the removal of harmful dusts, fumes, mists, vapors or gases at their source, as provided for in Regulation 217 is impracticable the employee who may be liable to harmful exposure shall be protected by means of respiratory or other protective equipment approved by the Ohio Department of Health for the specified employment involved.

(2) Protection of Temporary Nature: The use of respiratory equipment shall in general, be regarded as emergency protection against occasional and/or relatively brief exposure.

(3) Approval Required: Respiratory protective equipment including filter, cartridge and supplied-air respirators, hose masks, canister-type gas masks, supplied air-hoods and helmets, and self contained oxygen breathing apparatus shall be of a type approved by the Ohio Department of Health.

(4) Education and Use of Equipment Required: Employers and employees shall familiarize themselves with the use, sanitary care and limitations of such respiratory equipment as they may have occasion to use.

(5) Protection and Care of Equipment Required: Duty of Employer and Employee: It shall be the duty of the employer to provide and replace when necessary, such respiratory and other personal protective equipment as may be required, and to maintain same in efficient and sanitary condition.

It shall be the duty of the employee to use such equipment provided for him and to exercise due care to maintain same in efficient and sanitary condition. Protective devices and protective clothing shall be worn or used at all times during the period of exposure.

(6) Air Supply to Positive Pressure Equipment: Air supplied to hose masks and positive pressure air helmets shall be free from harmful dusts, fumes, mists, vapors, or gases to the extent that the inhalation of such air shall not constitute harmful exposure as set

forth in Regulation 217. The air should, preferably, be supplied by means of a blower-type fan. Whenever compressed air is used an approved filter shall be inserted in the supply line to remove any oil, sediment or contamination that it may contain. Such filter shall be maintained in efficient working condition.

(7) Whenever air is delivered to respiratory equipment, the intake to the blower-type fan, low pressure compressor or ordinary compressor shall be so located as to prevent harmful contamination of the air by carbon monoxide. Internally lubricated compressors are not recommended for supplying air to respirators and if internally lubricated compressors are so used they must be provided with a suitable temperature regulator to prevent overheating of the compressors and with a carbon monoxide alarm device to insure adequate warning of exposure to carbon monoxide.

(8) Air Pressure to be Regulated: Whenever positive air respiratory equipment is used, an automatic pressure relief valve shall be installed in the supply line. The maximum allowable pressure shall be so provided per square inch. This does not apply to self-contained oxygen breathing apparatus.

a. The standard of health protection when using positive-pressure air respiratory equipment is the maintenance of positive pressure within the equipment. The minimum of air pressure to be maintained within such equipment is therefore that which will assure a steady and continuous outward flow of air from within the apparatus.

(9) Sanitation of Respirator Equipment: The employer shall provide an approved means for cleaning and sterilizing all respiratory equipment, and it shall be the duty of the employer to cause such equipment to be maintained in a clean and sanitary condition. Respiratory equipment shall not be passed on from one man to another until such equipment is cleaned and sterilized. When filter or cartridge type respirators are used, each employee shall have such respirator for his own exclusive use. Respiratory equipment and replacement units shall be stored, when not in use, in approved containers.

Regulation 252. (Isolation of Hazardous Operations).

(1) In every place of employment where a work or process is carried on, in which, or in connection with which, dusts, fumes, mists, vapors or gases are produced in quantities or concentrations and under conditions which may injure the health of the employees, or where environmental conditions harmful to the health of employees are produced, such operations shall be isolated unless the employer elects to control and harmful exposure under other provisions of these regulations.

(2) Whenever practicable, the industrial operation or process shall be effectively controlled or enclosed to prevent harmful chemicals or injurious substances from coming in contact with the chem-

Regulation 233. (Sanitation and Cleanliness).

(1) **Maintenance:** The interiors, exteriors and environs of buildings that contribute to a harmful exposure to which these regulations apply shall be cleaned and maintained in such condition as will prevent harmful exposure as set forth in Regulation 247.

(2) **Cleaning: When to be Done:** Cleaning shall be done at such time of day or night as will cause a minimum of exposure of employees. Employees engaged in cleaning operations and all others who may be exposed shall wear approved respiratory equipment unless such cleaning is done by means of suction apparatus capable of preventing harmful exposure. n

Regulation 234. (Warning of Health Hazards). In all places of employment where harmful exposures exist from infective agents in materials used, from toxic dusts, fumes, mists, vapors or gases and from heat, radiation, humidity, radioactive material or any other injurious substance or cause, the employer shall call attention to such hazards, and shall periodically instruct all employees regarding the harmful exposures connected with their duties and the best preventive measures and methods to protect themselves therefrom.

Regulation 235. (Violation). A violation of any of the provisions of the foregoing regulations, or failure to comply with any orders made pursuant thereto by the Ohio Department of Health, shall subject the persons so violating or failing to comply to the penalties provided by law.

Regulation 236. (Interpretation). If any of the foregoing regulations shall be held to be unlawful, such holding shall not affect the validity of any other of the foregoing regulations.