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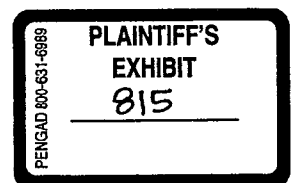
State of New York
Department of Labor
BOARD OF STANDARDS AND APPEALS



The Industrial Code
Rule No. 12

CONTROL OF AIR CONTAMINANTS IN FACTORIES

Effective November 1, 1958



STATE OF NEW YORK
DEPARTMENT OF LABOR

ISADOR LUBIN
Industrial Commissioner

BOARD OF STANDARDS AND APPEALS

William S. Maxwell, Chairman

H. Myron Lewis, Member

George S. Raymond, Member

Copies of this Rule may be obtained from the State of New York, Department of Labor, Office of the Administrative Director, The Governor Alfred E. Smith State Office Building, Albany 1, New York or State Office Building, 80 Centre Street, New York 13, New York, at a cost of 25 cents each. Checks and money orders should be made payable to the "Industrial Commissioner." Postage stamps not accepted.

RULE
Relating to
CONTROL OF AIR CONTAMINANTS IN FACTORIES

STATE OF NEW YORK
DEPARTMENT OF LABOR
BOARD OF STANDARDS AND APPEALS } ss:

In pursuance of the authority vested in me by the Labor Law and Section 382 of the Civil Practice Act, I, WILLIAM S. MAXWELL, CHAIRMAN OF THE BOARD OF STANDARDS AND APPEALS, New York State Department of Labor, DO HEREBY CERTIFY, that Industrial Code Rules 700 to 757 inclusive relating to removal of dust, gases and fumes and published in Industrial Code Bulletin No. 12 were duly adopted by the Industrial Board of the New York State Department of Labor November 20, 1930 to be effective January 1, 1931 and duly filed in the office of the Secretary of State of New York December 13, 1930; that thereafter, on April 23, 1941, Rules Nos. 752 to 756 inclusive were duly repealed by the Board of Standards and Appeals of the State of New York; that by Administrative Resolution of the said Board of Standards and Appeals dated May 12, 1954, the above mentioned Bulletin No. 12 and all the said Rules therein numbered from 700 to 757 inclusive, were designated Industrial Code Rule No. 12; that the said Industrial Code Rule No. 12 formerly designated Industrial Code Bulletin No. 12, as effective January 1, 1931, was duly repealed, said repeal to be effective October 1, 1956, and Industrial Code Rule No. 12 relating to Control of Air Contaminants was duly adopted by the said Board of Standards and Appeals on June 21, 1956 and prescribed to be effective October 1, 1956, pursuant to and by authority of Sections 27-a, 28, 29, 200 and 299 of the Labor Law; that said repeal and said Industrial Code Rule No. 12 relating to Control of Air Contaminants were filed in the office of the Department of State of New York on August 7, 1956; that said Rule was duly amended and adopted by the Board on July 23, 1958 and prescribed to take effect as amended on November 1, 1958, and said Industrial Code Rule No. 12 relating to Control of Air Contaminants in Factories was filed in the office of the Secretary of State of New York on August 1, 1958 pursuant to Section 29 of the Labor Law, Section 102 of the Executive Law and Section 8 of Article IV of the Constitution of the State of New York; that no part of Rule No. 12 has been amended or repealed except as above stated; and that the copy of said Rule contained in this pamphlet is a true and correct transcript of the whole original text of said Rule as amended.

Given under my hand and the seal of office of the Department of Labor at Albany, N. Y. this 1st day of August, 1958.

WILLIAM S. MAXWELL,
Chairman, Board of Standards and Appeals



EXTRACTS OF THE LABOR LAW

Section 28. Rules of the board of standards and appeals. Rules of the board of standards and appeals may be made for

1. The proper sanitation in all places to which this chapter applies and for guarding against and minimizing fire hazards, personal injuries and diseases in all places to which this chapter applies with respect to:

- a. The construction, demolition, alteration, equipment and maintenance of all such places, including the conversion of structures into factories, factory buildings and mercantile establishments;
- b. The arrangement and guarding of machinery and the storing and keeping of property and articles;
- c. The places where and the methods and operation by which trades and occupations may be conducted and the conduct of employers, employees and other persons;

It being the policy and intent of this chapter that all places to which it applies shall be so constructed, equipped, arranged, operated and conducted in all respects as to provide reasonable and adequate protection to the lives, health and safety of all persons employed therein, and frequenting the same, and that the board shall from time to time make such rules as will effectuate such policy and intent.

- d. The sanitation and adequate shelter as affecting the welfare and health of all persons employed by any railroad, pullman or express company.

2. Whenever the board finds that any industry, trade, occupation or process involves such elements of danger to the lives, health or safety of persons employed therein as to require special regulation for the protection of such persons, the board may make special rules to guard against such elements of danger by establishing requirements as to temperature, humidity, the removal of dusts, gases or fumes, by requiring licenses to be applied for and issued by the department as a condition of carrying on any such industry, trade, occupation or process, by requiring medical inspection and supervision of persons employed or applying for employment, and by other appropriate means.

3. The rules may be limited in their application to certain classes of establishments, places of employment, machines, apparatus, articles, processes, industries, trades or occupations or may apply only to those to be constructed, established, installed or provided in the future.

4. The rules of the board shall have the force and effect of law and shall be enforced in the same manner as the provisions of this chapter.

5. No provision of this chapter specifically conferring powers on the board to make rules shall limit the power conferred by this section.

Section 30. Variations. (Excerpt) If there shall be practical difficulties or unnecessary hardship in carrying out provisions of the Labor Law or of this rule, the Board may make a variation from the requirements thereof. Any person affected by such provision or rule, or his agent, may petition the Board for such variation stating the grounds therefor.

Section 110. Review by board of standards and appeals.

1. Any person in interest or his duly authorized agent may petition the board of standards and appeals for a review of the validity or reasonableness of any rule or order made under the provisions of this chapter.

2. The petition shall be verified, shall be filed in duplicate with the board of standards and appeals and shall state the rule or order proposed to be reviewed and in what respects it is claimed to be invalid or unreasonable. Any objections to the rule or order not raised in the petition shall be deemed waived. The board may join in one proceeding all petitions alleging invalidity or unreasonableness of substantially similar rules or orders. The filing of such petition shall operate to stay all proceedings against the petitioner under such rule or order until the determination of such review.

* * * * *

5. The decision of the board shall be final unless within thirty days after it is filed one of the parties commences an action as provided in section one hundred and eleven.

Section 200. General duty to protect health and safety of employees.

All places to which this chapter applies shall be so constructed, equipped, arranged, operated and conducted as to provide reasonable and adequate protection to the lives, health and safety of all persons employed therein. The board shall make rules to carry into effect the provisions of this section.

Section 299. Ventilation, heating and humidity.*.*

2. All machinery creating dust or impurities in quantities tending to injure the health of employees shall be equipped with proper hoods and pipes connected to an exhaust fan of sufficient capacity and power to remove such dusts or impurities; such fan shall be kept running constantly while such machinery is in use. If the board decides that such apparatus is unnecessary for the health and welfare of the employees, or that other means of protection may be provided to safeguard the health and welfare of the employees against such injurious dusts or impurities, it may adopt rules excepting such machinery from the operation of this subdivision, or prescribing such requirements as will effectuate the intent of this subdivision.

3. If dust, gases, fumes, vapors, fibers or other impurities are generated or released in the course of the business carried on in any workroom of a factory, in quantities tending to injure the health of the employees, suction devices shall be provided which shall remove such impurities from the workroom, at their point of origin where practicable, by means of proper hoods connected to conduits and exhaust fans. Such fans shall be kept running constantly while the impurities are being generated or released.

* * * * *

5. If any requirement of this section or any rule adopted thereunder be not complied with, the commissioner shall issue an order directing compliance therewith within thirty days after the service thereof. He may in such order require plans and specifications to be filed. In such case, before

providing or making any change or alteration in any machinery or apparatus for any of the purposes specified in this section, the person upon whom such order is served shall file with the commissioner plans and specifications therefor and shall obtain his approval of the same.

NOTES

The phrase "suffer or permit" as employed in this rule implies knowledge or the opportunity through reasonable diligence to acquire knowledge. This presupposes a fair measure of continuity and permanence. The phrase further implies the power to prohibit, prevent or hinder an act or condition. See *Peo. ex rel, Price vs Sheffield Farms, etc.*, 225 N. Y. 25, 30 and *Avon Bar and Grill, Inc. vs O'Connell*, 276 A.D. 517 and cases cited.

The rules of the board have the force and effect of law. A violation of the rules adopted by the Board is punishable as a penal offense. (Penal Law, Sections 1275, 1276, 1277).

THE INDUSTRIAL CODE — RULE NO. 12

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INDUSTRIAL CODE RULE NO. 12

Relating to

CONTROL OF AIR CONTAMINANTS IN FACTORIES

12-1 APPLICATION

This rule applies in and to all factories in the State of New York except as otherwise provided by law and to all persons employed therein and to their employers in respect to all materials, processes and operations generating, releasing or disseminating air contaminants. In respect to contaminants resulting from such processes or operations the following rules, which contain references to the prevention and control of air contaminants, and other provisions of the Industrial Code in regard thereto which may be adopted after November 1, 1958, shall govern where inconsistent with this rule:

Industrial Code Rule No. 4 — Relating to Bakeries and Confectioneries.

Industrial Code Rule No. 10 — Relating to Equipment, Maintenance and Sanitation of Foundries and the Control of Dust, Gases and Fumes in Foundries.

Industrial Code Rule No. 11 — Relating to Milling Industry and Malt Houses.

Industrial Code Rule No. 23 — Relating to Protection of Persons Employed in the Erection, Repair and Demolition of Buildings or Structures.

Industrial Code Rule No. 27 — Relating to Construction, Equipment, Maintenance and Operation of Laundries.

Industrial Code Rule No. 29 — Relating to Dry Dyeing Plants and Dry Cleaning Plants.

Industrial Code Rule No. 33 — Relating to Control of Silica Dust in Rock Drilling.

Industrial Code Rule No. 34 — Relating to Control of Silica Dust in Stone Crushing Operations.

Industrial Code Rule No. 35 — Relating to Control of Silica Dust in Stone Cutting and Stone Finishing Industry.

Industrial Code Rule No. 38 — Relating to Radiation Protection.

The provisions of Industrial Code Rule No. 18 relating to exhaust systems shall apply for operations not specifically covered by the above rules.

12-2 DEFINITIONS

As used herein and in connection with this rule the following terms mean:

1. **Air Contaminants.** Air-borne substances, such as dusts, fibres, fumes, gases, mists, vapors and other impurities.

2. **Air Mover.** Any device which produces forced air flow, such as a fan, ejector, or natural draft stack.

3. **Approved.** In respect to a device or material: in compliance with a subsisting resolution of approval adopted by the Board; in respect to action by the Board: made the subject of a resolution of approval.

4. **Board.** The Board of Standards and Appeals of the State of New York.

5. **Commissioner.** The Industrial Commissioner of the State of New York.

6. **Confined Space.** A space so enclosed that dangerous air contamination therein cannot be prevented or removed by natural ventilation through openings in the enclosure.

7. **Control Equipment.** Equipment used to prevent air contamination or reduce or remove air contaminants.

8. **Dangerous Air Contaminants.** Air contaminants in quantities tending to injure the health of employees or creating a fire or explosion hazard, or in quantities greater than 50% of the lower explosive level of any mixture or compound which they may form.

9. **Dilution Ventilation.** A ventilation system other than local ventilation which reduces air contamination to safe levels by the introduction of uncontaminated air.

10. **Dipping.** The application of industrial products coating material by means of total or partial immersion.

11. **Employee.** A person employed; one who works for wages or salary in the service of another.

12. **Exhaust System.** A ventilating system operating under negative pressure for the control of air contaminants.

13. **Fibres.** Particles produced by handling, cutting, stripping, spinning or weaving of cotton, wool, fur, asbestos or other material constituted of thread-like or slender elements.

14. **Flammable.** Capable of igniting and continuing to burn when brought in contact with an open flame, glowing combustion or other source of ignition.

15. **Impregnating.** Application of liquid material by permeation or saturation.

16. **Industrial Products Coating.** Painting and similar finishing of industrial products.

17. **Local Exhaust Ventilation.** A system of ventilation for collecting and removing air contaminants at the source of generation.

18. **Mechanical Ventilation.** A system of ventilation having a power-driven air mover.

19. **Open Surface Tank Operation.** An operation which involves the use of tanks of liquids with the liquid surface directly exposed to the work atmosphere. These operations may include but are not limited to washing,

electro-plating, anodizing, pickling, quenching, dyeing, dipping, tanning, dressing, bleaching, degreasing, alkaline cleaning, stripping, rinsing, digesting and other similar operations.

20. Personal Respiratory Protective Equipment. A respirator or other device worn for the purpose of preventing the wearer from inhaling harmful amounts of air contaminants.

21. Practicable. Capable of being done without disturbing essential functions or essential structural elements.

22. Recirculation. The return of part or all of the exhaust air to any space occupied by employees.

23. Shall. The word "shall" is always mandatory.

24. Spraying. The application of liquid material in the form of a mist.

25. Spreading. The application of liquid material to a surface by brush, roller, flow or similar method.

26. Working Area or Space. The area or space normally occupied or traversed by an employee while at work.

27. Work Atmosphere. The atmosphere to which an employee is exposed in the course of performing his work.

12-3 RESPONSIBILITY OF EMPLOYERS

1. Every employer shall effect compliance with the provisions of this rule relating to the prevention and removal of air contaminants, the storage and use of flammable liquids and the provision, installation, operation and maintenance of control or protective equipment.

2. Every employer shall instruct his employees as to the hazards of their work, the use of the control or protective equipment, and their responsibility for complying with this rule.

3. No employer shall suffer or permit an employee to work in a room in which there exist dangerous air contaminants in a work atmosphere.

4. No employer shall suffer or permit dangerous air contaminants to accumulate or remain in any factory.

12-4 RESPONSIBILITY OF EMPLOYEES

Every employee shall use the control and protective equipment provided for his protection and shall comply with all provisions of this rule relating to his personal conduct.

12-5 EXISTING EQUIPMENT

Control equipment installed prior to November 1, 1958 in accordance with the provisions of the Industrial Code then in effect and which is so maintained is exempt from all other or different provisions of this rule while such maintenance continues.

12-6 PREVENTION OF AIR CONTAMINATION

All operations producing air contaminants shall be so conducted that the generation, release or dissemination of air contaminants is kept at the lowest practicable level. In any factory where the sources of air contamination are by reason of their extent, quantity or kind incapable of producing dangerous air contaminants, the provisions of this rule shall not apply.

12-7 GENERAL MAINTENANCE OF EQUIPMENT

All equipment used to effect compliance with this rule shall be maintained in good condition and in accordance with the requirements of the law and the Industrial Code.

12-8 GENERAL CONTROL REQUIREMENTS

Dangerous air contaminants shall be removed or controlled as prescribed in this rule.

12-9 GENERAL CONTROL METHODS

One or more of the following methods shall be used to prevent, remove or control dangerous air contaminants:

1. Substitution of a material or a method which does not produce dangerous air contaminants.
2. Local exhaust ventilation conforming to the requirements of Industrial Code Rule No. 18.
3. Dilution ventilation
4. Application of water or other wetting agent.
5. Enclosure or isolation.
6. Other methods approved by the Board.

12-10 EXHAUST SYSTEMS

Every exhaust system required by this rule shall be constructed, installed, operated and maintained in compliance with the provisions of Industrial Code Rule No. 18 relating to Exhaust Systems.

12-11 ISOLATION OR SEGREGATION OF OPERATIONS

All processes or operations releasing or disseminating dangerous air contaminants shall be isolated, enclosed or otherwise segregated insofar as practicable.

12-12 SEPARATION OF DIFFERENT PROCESSES CREATING A HAZARD

Where processes generate different air contaminants which could, if intermixed, result in a fire or explosion hazard, such contaminants shall be exhausted by separate systems so as to eliminate such possibility.

12-13 PREVENTION OF IGNITION

All processes or operations using or generating air contaminants which constitute a fire or explosion hazard shall be protected from sources of accidental ignition. Unless such processes or operations are isolated by tight partitions or enclosures they shall not be conducted within 20 feet of any materials, devices or operations which produce flames or sparks including, by way of illustration but not by way of limitation, engines, motors, welding and soldering torches. All processes and operations within 20 feet of any spark or flame producing work such as welding shall be discontinued and all ignitable air contaminants, flammable liquids and accumulated flammable residue shall be removed from the area of the flame or spark hazard before such work is begun.

12-14 PERSONAL RESPIRATORY PROTECTIVE EQUIPMENT

12-14.1 Use. Personal respiratory protective equipment shall not be used in lieu of other control methods, except for protection of employees in emergencies and in the repair, maintenance or adjustment of equipment or processes, or upon specific approval by the Board.

12-14.2 Approval. Personal respiratory protective equipment shall be of a type approved by the Board for the particular class of substance or substances constituting the air contaminant.

Note: A list of approved respiratory protective equipment may be secured from the Board.

12-14.3 Maintenance. Personal respiratory protective equipment shall be stored in air-tight containers or cabinets or in an uncontaminated area. Equipment shall be cleaned, serviced and repaired to maintain it in effective working condition and it shall be sterilized before use by any person other than the last wearer.

12-15 GOGGLES, MASKS AND SHIELDS

All employees exposed to air contaminants tending to injure or irritate the eyes shall be provided with and shall wear either safety goggles, close-fitting chemical goggles or an effective face mask or shield. An employee requiring prescription lenses in the normal performance of his work shall be supplied with prescription goggles or with goggles designed to fit over his regular spectacles.

12-16 PROTECTIVE CLOTHING

All employees exposed to air contaminants which tend to cause skin irritation or skin diseases, or which can be absorbed through the skin in amounts tending to injure the health, shall be provided with appropriate clean, protective clothing, such as coveralls, coats, headgear, gloves, sleeves or aprons as needed or where suitable.

12-17 EMERGENCY FLUSHING FACILITIES

Emergency showers or other facilities for flushing the skin and body members shall be provided within 50 feet of the working position where employees may be exposed to sudden and severe concentrations of corrosive air contaminants.

12-18 FLEXIBLE ELECTRICAL CORDS AND PORTABLE LIGHTS

Flexible electrical cords used in any area where flammable liquids are being used or stored or where flammable air contaminants may be present shall be of the three-conductor, extra heavy service type manufactured for the purpose and shall be fully insulated and grounded. All connections shall be explosion-proof. Portable lights used in such areas shall be shielded against breakage.

12-19 MIXING AND THINNING OF FLAMMABLE LIQUIDS

The mixing and thinning indoors of flammable liquids in unit quantities greater than 55 gallons shall be done only in a mixing or spraying room and in such manner and under such ventilation as will effect compliance of this rule. Lesser quantities shall be mixed or thinned indoors only in such a room or within a hood, booth or working area provided with such ventilation.

12-20 EMPTIED CONTAINERS

Emptied drums or other containers shall not be stored indoors unless they have been purged of all contents constituting or creating dangerous air contaminants. Purging shall be done in a mechanically ventilated area if performed indoors. Compressed air shall not be used for purging containers.

12-21 USE OF CERTAIN FLAMMABLE LIQUIDS

The use of flammable liquids having a flash point of 100° F. or less determined by the Tagliabue open cup test for paint removal or cleaning or any other process in which they are unprotected and exposed, shall be restricted to areas provided with mechanical ventilation creating an air movement of at least 100 FPM over the surface of the work while the work is being carried on. The use of benzene for such operations is prohibited. A room in which such operations are being conducted shall comply with Article 12-6 of this rule.

12-22 REFUSE MATERIAL

In the vicinity of every process or operation to which this rule applies there shall be provided metal containers with self-closing covers and bearing the notice "FLAMMABLE WASTE." Such containers shall be used for scrapings, sweepings and other waste containing or consisting of flammable material. Such refuse shall be disposed of at the end of each day by burying, burning or other safe treatment but no such refuse shall be burned in a furnace.

12-23 PROTECTION OF ADJACENT OCCUPANCIES

12-23.1 Wall and Ceiling Construction. No employer shall suffer or permit flammable liquids to be used or dispensed in any room above or below or adjoining one in which there is an employee occupancy unless either:

1. The room is part of a building which is a fireproof building or a fire resisting building complying with Industrial Code Rule No. 7, or

2. The walls and ceiling of the room within 20 feet horizontally of the working area are so constructed as to have a fire-resistance rating of at least one hour in accordance with Industrial Code Rule No. 7 and, if there be an employee occupancy below such room, the floor of the room within such distance is of incombustible material and is waterproof, or

3. Such room is equipped with automatic sprinkler protection conforming to Industrial Code Rule No. 20.

12-23.2 Wall Openings. Wall openings in every such room shall be provided with approved three-quarter hour self-closing fire doors or with approved three-quarter hour fire windows. No such room shall have any window openings beneath or within ten feet horizontally of any fire escape or required exterior stairway.

12-24 SPECIFIC OPERATIONS AND SPECIFIC CONTROL REQUIREMENTS

12-24.1 Grinding and Polishing Wheels, etc. Grinding, polishing, buffing, scratch-brushing, abrasive cutting-off wheel and grinding or polishing belt strap operations generating dangerous air contaminants shall be provided with local exhaust ventilation and an air cleaning device.

Exceptions:

1. Wet grinding with other than sand stone wheels and wet polishing and buffing operations if enclosures are provided which prevent splash or dispersion of liquids, abrasive compounds or mists into the workroom.

2. Intricate and precision grinding discs or wheels not over one inch in diameter.

3. Grinding or polishing of articles and instruments made of gold and platinum.

4. Intermittent tool grinding operations used for shop purposes only.

12-24.2 Woodworking Machines. Woodworking operations generating dangerous air contaminants shall be provided with local exhaust ventilation and an air cleaning device.

12-24.3 Melting Apparatus. Vessels operated at or in excess of the temperature of volatilization of toxic metals, alloys or compounds which generate dangerous air contaminants shall be provided with local exhaust ventilation. Vessels used for melting or cleaning such metals, alloys or compounds shall be provided with exhaust ventilation when operated in such a manner as to generate dangerous air contaminants. The combustion chamber, when operated in such a manner as to release dangerous air contaminants, shall be provided with local exhaust ventilation.

Exception: Portable receptacles or apparatus which have no fixed location and are used intermittently and which produce no dangerous air contaminants.

12-24.4 Open Surface Tank Operations.

12-24.4.1 Open Surface Tank Operations. Open surface tank operations creating dangerous air contaminants shall be provided with ventilation to control such contaminants. (See Industrial Code Rule No. 18)

12-24.4.2 Classes of Operations. Open surface tank operations are classified into groups in accordance with both hazard potential and rate of contaminant release as set forth in Article 18-14 of Industrial Code Rule No. 18.

12-24.4.3 Humidity Control. When heat is added to the workroom to prevent the condensation of water vapor evaporated from open tanks into mist, such additional heat shall be so controlled that it does not raise the wet bulb temperature in the lower six feet of the workroom above 80° F.

12-24.4.4 Cleanout Doors. Tanks or machines used for cleaning by solvents and having a surface vapor area of more than two square feet shall be equipped with suitable cleanout or sludge doors located near the bottom of each tank or still. Such doors shall be constructed and maintained so that there is no leakage of solvent when closed.

12-24.4.5 Solvent Transfer.

1. Transfer of flammable solvents from containers shall be by means of a hose or pipe leading to the bottom of the tank being filled. Containers between which the transfer is being made shall be electrically bonded and grounded with a resistance of less than 25 ohms.

2. Volatile solvents shall not be stored or transferred in uncovered vessels.

12-24.4.6 Vapor Phase Degreasing.

12-24.4.6.1 Freeboard. The level of the vapors shall be kept below the top edge of the tank by a distance equal to at least one-half the tank width or 36 inches, whichever is less.

12-24.4.6.2 Heating.

1. Gas. Where gas is used as fuel for heating, the combustion chamber shall be tight construction, except for necessary combustion and flue openings. Mechanically ventilated flues shall be independent of the exhaust duct. Natural draft flues shall be provided with draft diverters. All flues shall be constructed of corrosion-resistant material.

2. Electric. Electric heating units shall be constructed of materials resistant to the tank contents and shall be constructed and installed so as to prevent hot spots.

12-24.4.6.3 Thermostatic Control. Every tank shall be provided with two thermostats, one of which shall be connected to control or shut-off the source of heat when the contents reach a temperature not higher than 20° F in excess of the boiling point of the solvent in its uncontaminated state and the other of which shall be located above the vapor zone and be adjusted to shut-off the source of heat when the temperature in the zone of the thermostat is at the boiling point of the solvent.

12-24.4.6.4 Condensers. Tanks shall be equipped with condensing or cooling surfaces consisting of pipes, coils, water jackets or any combination thereof located on at least two sides in the upper portion of the tank above the solvent liquid level. Water, refrigerant or other cooling media shall be circulated through the condenser whenever the tank is in operation.

12-24.4.7 Operation.

1. Where tanks are provided with loading hoists, the hoists shall be designed to raise and lower the work at a speed not greater than 11 feet per minute.

2. All products after immersion in solvents shall be held in the vapor zone of the tank and shall not be withdrawn from the tank until the product reaches the vapor temperature as evidenced by the stopping of vapor condensation on the product.

3. Loading racks shall be of metal or equally impervious material.

4. Projected area of product or rack shall not be greater than $\frac{2}{3}$ the area of the tank.

12-24.4.8 Cleaning of Tanks.

1. Before cleaning the interior of any tank, the contents shall be drained off and the cleanout doors, if any, shall be opened. All pockets in tanks or pits where vapors may collect shall be ventilated and cleared.

2. Every worker engaged in cleaning the interior of any tank in which dangerous air contaminants are present shall be provided with an approved airline respirator or mask unless the work atmosphere is cleared of dangerous air contaminants by mechanical ventilation. A stand-by worker trained to render immediate assistance in an emergency shall be provided during the cleaning operation.

3. Floors and platforms around tanks shall be maintained in accordance with Industrial Code Rule No. 16.

12-24.4.9 **Welding, Open Flame, etc.** No work involving welding, open flame or other sources of ignition shall be done at or about any equipment for open surface tank operations unless such equipment has first been thoroughly cleaned of all flammable or volatile solvents and their vapors or is protected by distance or by shielding against accidental ignition or heating from such work.

12-24.4.10 Special Precautions for Cyanide.

1. Where rinse, acid and cyanide tanks are so installed and used that any of them may be contaminated with cyanide or acid, such tanks shall be provided with local exhaust ventilation.

2. Cyanide tanks shall not be provided with drains or overflows which will allow the tank contents to mix with liquid drained from other tanks either on the floor or in floor drains unless the cyanide drainage has been properly neutralized.

3. Cyanide salts shall be stored in a locked enclosure and set above the level of any floor on which acid carboys are stored.

12-24.5 Tumbling Processes.

12-24.5.1 **General Provisions.** Tumbling processes creating dangerous air contaminants shall be provided with means to remove or control such contaminants at the point of generation.

Exception: The above does not apply to mills, drums, cages or barrels which are completely enclosed during rotation and disseminate air contaminants only when being charged or discharged. Means shall be provided to control such contaminants.

12-24.6 Abrasive Blasting Operations.

12-24.6.1 General Provisions. Abrasive blasting operations creating dangerous air contaminants shall be enclosed as completely as practicable and shall be provided with a local exhaust system to remove the air contaminants.

Exception: Outdoor abrasive cleaning operations where the operator is furnished with and wears an approved air line respirator.

12-24.6.2 Operation. Approved air respiratory protective equipment of the supplied air type shall be used by workers employed in abrasive blasting rooms or tunnels.

12-24.6.3 Air Supply. Air furnished to air line respiratory equipment shall be clean.

12-24.7 Crushing, Milling, Screening, Mixing and Conveying.

12-24.7.1 General Provisions. Crushing, milling, screening, mixing and conveying and related processes creating dangerous air contaminants shall be enclosed and provided with local exhaust ventilation to remove or control the air contaminants at the point of generation.

12-24.8 Welding, Brazing, Flame Cutting and Metallizing.

12-24.8.1 General Requirements. Welding, brazing, flame cutting and metallizing operations creating dangerous air contaminants shall be provided with ventilation to control such contaminants.

12-24.8.2 Classes of Operations. Operations involving welding, etc., are divided into the following classes for the purposes of this rule:

Class I—Operations in confined spaces involving toxic metals including but not limited to antimony, beryllium, cadmium, lead, mercury, selenium or tellurium, or involving fluorine or any alloy, compound or flux containing any one or combination thereof or other dangerous air contaminants.

Class II—Operations in confined spaces involving metals, alloys or compounds other than those listed in Class I.

Class III—Operations in unconfined spaces involving metals, alloys or compounds listed in Class I.

Class IV—Operations in unconfined spaces involving metals, alloys or compounds listed in Class II.

12-24.8.3 Protection of Operators.

Class I Requirements. Every employee required to work within a confined space where any Class I operation is performed shall be furnished an approved air line respirator or supplied air helmet, and the confined space shall be ventilated at a minimum rate of 1000 c.f.m. per welder within the enclosure.

Class II Requirements. Every employee required to work within a confined space where any Class II operation is performed shall be furnished an approved air line respirator or supplied air helmet or the confined space shall be ventilated at a minimum rate of 1000 c.f.m. per welder within the enclosure.

Class III Requirements. Every Class III operation shall be provided with local exhaust ventilation.

Class IV Requirements. Every Class IV operation at a fixed location as part of a production process shall be provided with local exhaust ventilation where practicable. All other Class IV operations shall be provided with dilution ventilation.

Exceptions: The following Class IV operations are excepted from the above requirements:

1. Spot Welding.
2. Operations which are not usual shop practice.
3. Out-of-door operations.

12-24.9 Exhaust Gases From Motor Vehicles Operating in Enclosed Areas.

12-24.9.1 General Provisions. Enclosed areas in which internal combustion motor vehicles are operated and release dangerous air contaminants shall be provided with means to remove or control the fumes, gases or vapors released or disseminated.

12-25 INDUSTRIAL PRODUCTS COATING

12-25.1 Required Ventilation. Coating shall be conducted in a hood, booth or enclosure complying with this rule and Industrial Code Rule No. 18 and provided with a minimum air velocity of 100 feet per minute in the breathing zone of any operator who works within the booth, or a minimum velocity of 100 feet per minute through all openings of any booth at which the operator stands in front of the booth.

Exception: Downdraft systems of exhaust ventilation shall provide such an air velocity as will prevent air contamination in the breathing zone of the operator.

12-25.2 Heating. Units used for comfort heating any space to which this rule applies in which flammable liquids are used, handled or stored shall be confined to the use of low pressure steam or hot water or indirect forced warm air. Direct warm air heating systems may be used subject to approval by the Board. Heating units shall be kept free of deposits of flammable compounds.

12-25.3 Drainage of Flammable Liquid Waste. Every drainage system which conducts flammable liquid wastes shall be provided with traps. Flammable liquid wastes shall be prevented from entering the plant drainage system.

12-25.4 Maintenance and Operation.

12-25.4.1 Maintenance of Equipment. All equipment required by this rule shall be maintained in good repair and proper operating condition.

12-25.4.2 Purging. Exhaust systems shall continue in operation for a sufficient period of time after conclusion of coating operations to clear the air of dangerous air contaminants.

12-25.4.3 Floor Maintenance. The floor within and in the immediate vicinity of the working area shall be kept clean and clear of any waste material or any obstruction. Where dust may be created by dry sweeping, floors shall be wet down with a non-flammable wetting agent before sweeping.

12-25.4.4 Passage Space. A minimum passage space of three feet shall be provided for access to every working station.

12-25.4.5 Containers. All tanks and containers used for flammable liquids shall be of incombustible material and shall be kept closed whether full or empty, except as may be necessary for operational purposes.

12-25.4.6 Transfer of Flammable Liquids. The transfer of flammable liquids having a flash point of less than 100 degrees F. shall be by means of a hose or pipe leading to the bottom of the vessel being filled. When transferring such liquids from one metal container to any other metal container the two containers shall be bonded together electrically and properly grounded.

12-25.4.7 Vehicles. Vehicles shall not be taken into or out of spray coating spaces under their own power, unless the exhaust system is operating.

12-25.4.8 Use of Different Types of Coating Materials. Where different types of coating materials are used in the same booth or space, the booth or space shall be thoroughly cleaned of previous coating deposits before commencing the application of the new substance.

12-25.4.9 Mixing and Thinning. The mixing or thinning of flammable liquids in unit quantities greater than 55 gallons shall be done in a mixing or spray room provided with ventilation as specified in Industrial Code Rule No. 18. Lesser quantities, when mixed indoors, shall be mixed within a hood, booth or other working area provided with exhaust ventilation as required in Section 12-25.1.

12-25.4.10 Coating Removal by Use of Solvents. The process shall be provided with adequate exhaust ventilation while the removal of residue paint or other coating material is being carried on. The rate of ventilation shall be that specified in this Article and Industrial Code Rule No. 18.

Note: Use of benzene or carbon tetrachloride for this operation is prohibited.

12-25.4.11 Sanding. Sanding of surfaces containing lead or lead pigment shall be done either with sandpaper wetted with water or in an area provided with an exhaust system providing ventilation at a minimum rate of 150 f.p.m. in the breathing zone of the worker.

12-25.4.12 Cleaning Solvents. Flammable liquids used for cleaning permanent surfaces other than floors in a working space shall have a flash point above 100 degrees F. Use of benzene for this operation is prohibited. No flammable liquids shall be used to clean floors.

12-25.4.13 Cleaning of Hoods and Booths. Exhaust fans and the interior of hoods, booths and ducts shall be maintained free of accumulations of coating material.

12-25.4.14 **Lining of Spray Booths.** Material for lining of spray booths or hoods, if used, shall cover the inner sides of the booth or hood without overhanging and shall be maintained in contact with the walls of the booth or hood. Loose sections shall be removed or shall be reappplied to the wall surface.

12-25.5 **Tanks, Troughs and Mechanical Application.**

12-25.5.1 **Enclosed Operations.** Enclosed coating or solvent cleaning operations and any subsequent drying operations shall be mechanically ventilated to maintain the concentration of vapors within the enclosure below 50 percent of the lower explosive limit. Necessary work openings of such enclosures shall have an inward air flow maintained by mechanical ventilation.

12-25.5.2 **Fire Protection.** Tanks and troughs containing flammable liquids used for manual dipping operations shall be provided with heat actuated automatically closing covers arranged so as not to interfere with exhaust ventilation. Where the dipping operation is done automatically the tank and troughs shall be provided with approved fire extinguishing systems.

Note: For additional requirements on fire protection, see Section 12-27.9.

12-25.5.3 **Installation of Tanks.** Tanks shall be arranged to prevent accidental tipping.

12-25.5.4 **Heating of Liquids.** Devices used for heating flammable liquids shall be provided with an automatic temperature regulating device so arranged that the source of heat shall be automatically shut-off when the temperature of the liquid rises above the normal operating temperature.

12-25.6 **Forced Drying and Baking.**

12-25.6.1 **Construction.** Ovens, cabinets, other enclosures and duct work used for forced drying or baking systems shall be constructed of incombustible material with expansion joints provided in the oven framing. Duct work shall be provided with two inches clearance or three-fourths inch of incombustible rigid insulation where the duct work passes through combustible walls, floors or roofs. The temperature of surfaces in contact with walls, floors or roofs shall not exceed 160 degrees F. The floor surface of the oven shall be of incombustible material and extend at least one foot beyond the oven outline. Interior surfaces shall be smooth.

12-25.6.2 **Ventilation.** Ovens, cabinets and other enclosures used for such purpose shall be provided with mechanical ventilation to maintain the concentration of flammable vapors below 50 percent of the lower explosive level at all times. Ovens shall be exhausted mechanically so that an inward air flow shall be maintained through all openings to prevent escape of dangerous air contaminants. The fans of such exhaust ventilating and any recirculating systems shall be interlocked to the heat supply by means of approved air flow switches so that the heat supply shall be cut-off unless the fan maintains the required air flow. Conveyors shall be interlocked with the oven exhaust and any recirculating fans so that the conveyors cannot operate unless such fans are operating.

When persons are required to enter the drying enclosure, the concentration of air contaminants shall be maintained below the danger level by mechanical ventilation.

12-25.6.3 Explosion Vents. Ovens in which flammable vapors or combustible gases may be present shall be equipped with explosion relief panels to relieve internal explosion pressures. Such vents shall provide an unobstructed aggregate area of one square foot of panel opening to each fifteen cubic feet of oven volume, allowance being made for access openings and doors arranged to yield easily to internal pressure. Relief panels shall, if practicable, be located in the top of the enclosure and be made of material, other than glass, which shall easily yield to internal pressure. On long ovens explosion panels shall be distributed to provide effective explosion relief. Explosion panels shall be located and arranged so as not to create a hazard to employees or other work spaces. Panel edges shall be maintained free of condensate and other solid material to insure proper operation.

12-25.6.4 Controls. Fan switches shall be interlocked with the fuel valve through a time delay arrangement to assure proper prevention before the fuel is ignited. Where necessary, enclosure doors shall have a limit switch interlock to prevent the time delay relay from operating unless the enclosure doors are open.

The fuel supply line shall be provided with a pressure switch to shut off the fuel supply when fuel supply pressure is insufficient. The switch shall not reopen the fuel valve automatically.

An excess temperature limit switch shall be provided to cut off the fuel supply when oven temperature exceeds the safe limit. The switch shall not reopen the fuel valve automatically.

Combustion safeguards shall be provided to shut off the fuel supply in the event of pilot light or ignition failure.

12-25.6.5 Dampers. Air supply or exhaust volume control dampers shall be adjusted properly and fixed securely. Dampers shall be designed to prevent full closure.

12-25.6.6 Combination Booths. Where coating and forced drying are done alternately in the same booth or enclosure, the following requirements shall be complied with:

a. During coating operations, the drying apparatus and electrical connections and wiring thereto shall not be located within the coating enclosure nor in any location where coating residue may be deposited thereon, and

b. Coating apparatus, drying apparatus and ventilating system of the coating enclosure shall be equipped with suitable approved interlocks so arranged that coating apparatus cannot be operated while drying apparatus is inside the coating enclosure and the coating enclosure shall be purged of coating vapors for a period of not less than three minutes before drying apparatus can be energized; the ventilating system shall continue in operation during the drying process and in the event of failure of the ventilating system, the drying apparatus shall shut off automatically.

12-25.6.7 Cleaning. The inside surfaces of the drying enclosure shall be maintained clean. Cleaning tools shall be of non-ferrous material.

12-25.7 Storage.

12-25.7.1 Enclosure of Storage Rooms. The floor surface of rooms used for storage of flammable liquids shall be of incombustible material and shall be waterproof. The room enclosure shall be of construction having the following minimum fire-resistive rating:

Walls	1 hour
Doors	$\frac{3}{4}$ hour
Windows	$\frac{3}{4}$ hour
Ceiling (if space above is occupied)	1 hour
Floor	1 hour

(For rules on fire-resistive construction see Industrial Code Rule No. 7)

12-25.7.2 Location of Storage Rooms. Storage rooms for flammable liquids shall be located at or above grade and an exterior wall of the building shall form at least one wall of the room. No opening in any storage room shall be located within 15 feet of any stairway, elevator shaft or building exit.

12-25.7.3 Floor Drainage and Door Sills. Floors of storage rooms shall be arranged to provide drainage of liquids and the drain shall be provided with a trap to prevent the spread of fire. Sills of non-combustible material at least six inches high or a six inch deep gutter covered with grating shall be provided at every door leading into a storage room.

Note: See Section 12-25.3 for drainage requirements.

12-25.7.4 Limitation of Quantities. No more than one day's supply or 220 gallons of flammable liquid, whichever is less shall be kept in a workroom. Such supply, unless kept in closed drums, shall be kept in cabinets as follows:

a. Cabinets for storing quantities of flammable liquid not exceeding 110 gallons shall be of at least incombustible single wall construction and shall be vented to the outer air.

b. Cabinets for storing quantities of flammable liquid of more than 110 gallons but less than 220 gallons shall be of incombustible double wall construction with an air space of at least $1\frac{1}{2}$ inches or metal-covered wood construction throughout and shall be vented to the outer air at top and bottom.

c. Quantities exceeding 220 gallons shall be kept in a storage room as specified in Paragraphs 12-25.7.1, 12-25.7.2 and 12-25.7.3. Doors to storage cabinets shall be kept closed and latched.

12-25.7.5 Container Covers. Containers used for flammable or toxic liquids shall be kept covered tightly when not in use or when being moved about whether or not they contain such material.

12-25.7.6 Ventilation. Storage rooms shall be provided with a minimum rate of ventilation of 5 cubic feet per minute per square foot of gross floor area and the ventilation shall be maintained during transfer, mixing or thinning operations of quantities less than 55 gallons. For quantities in excess of 55 gallons see Paragraph 12-25.4.9.

12-25.8 Electrical Equipment.

12-25.8.1 Wiring and Equipment. All electric wiring and electric equipment shall be of good quality and properly installed. Wiring within 10 feet of a working area or within a storage room shall be installed in sealed rigid metal conduit with explosion-proof fittings.

Exception: Coating operations not involving flammable solvents.

12-25.8.2 Lighting. Artificial lighting shall be by electricity. Lamps within areas where flammable liquids may be used or stored or where flammable vapors may be present shall be of the totally enclosed type and shall be protected against breakage either by location or by lamp guards. Lamp sockets shall be non-metallic shells and of the switchless type. Illumination of hazardous areas through panels of transparent material is permitted only under the following conditions:

1. Fixed lighting units shall be used as the source of illumination.
2. The panel shall effectively isolate the hazardous area from the area in which the lighting unit is located.
3. The transparent panel shall conform to Section 18-20.1 of Code Rule No. 18.
4. The installation shall be such that the normal accumulation of hazardous residue on the exposed surface of the panel will not be raised to a dangerous temperature by heat radiation or conduction from the source of illumination.

12-25.8.3 Control Equipment. Switches and other control devices, unless explosion-proof, shall be located at least 10 feet from the working area and outside of storage rooms.

12-25.8.4 Other Equipment. All electrical equipment located in a storage room or the interior of coating hoods or their exhaust ducts shall be explosion-proof. Systems designed to salvage deposits by collecting them in flammable solvent shall have the controls so arranged that the solvent pump cannot operate unless the ventilating fan is operating.

12-25.8.5 Grounding of Equipment. All mechanical equipment used for the application of flammable liquid and all metal booths, hoods, tanks, troughs, conveyors, fans and motor housings and all belts within a working area shall be grounded effectively.

12-25.8.6 Electrostatic Apparatus. The installation and use of electrostatic apparatus shall comply with the applicable portions of this rule and to the following requirements:

12-25.8.6.1 Approval Required. Only approved electrostatic apparatus shall be used.

12-25.8.6.2 Conductive Coatings. This method shall not be used for spraying conductive coatings.

12-25.8.6.3 Hand Operations. Manually operated spray guns or atomizers shall not be used in an electrostatic field.

12-25.8.6.4 Location. Electrostatic apparatus and devices used in connection with paint spraying, dipping or other coating operations shall have transformers and power packs located outside spray booths or enclosures and areas subject to paint deposit.

12-25.8.6.5 Supports. Electrodes and electrostatic atomizing heads shall be rigidly supported and permanently installed and shall be effectively insulated from ground.

12-25.8.6.6 **Clearance.** Space shall be maintained between articles being finished and electrodes, electrostatic atomizing heads or conductors of at least twice the sparking distance.

12-25.8.6.7 **Articles on Conveyors.** Articles on conveyors shall be so arranged and supported as to maintain the required clearances.

12-25.8.6.8 **Automatic Controls.** Electrostatic apparatus shall be equipped with automatic controls arranged to make the entire equipment dead if the ventilation of the spraying area falls below that required in Section 18-20.1 of Industrial Code Rule No. 18, or if too large an article is placed on the conveyor, or if the conveyor stops.

12-25.8.6.9 **Guarding and Isolation of Process.** All parts of the equipment carrying high potential and the electrical field shall be located, guarded and fenced off to provide safe isolation of the process. Guards and fences shall be of conducting material and shall be grounded.

12-25.8.6.10 **Signs.** A suitable sign stating the sparking distance shall be posted conspicuously near the assembly. Signs designating the process zone as dangerous by reason of fire and accident hazard shall be posted.

12-25.8.6.11 **Insulators.** Insulators shall meet the test standards for insulators of the Board for the potential used and shall be maintained clean and dry.

Note: The standards adopted by the Board relating to the test requirements of insulators are basically identical with the test requirements set forth in C-29.1 — September 1944 of the American Institute of Electrical Engineers.

12-26 FIRE FIGHTING EQUIPMENT

12-26.1 **Automatic Sprinklers.** An automatic sprinkler system with sufficient heads or outlets shall be provided in all working areas of buildings two stories or more in height where flammable coating liquids are applied or stored.

Note: For sprinkler system requirements see Industrial Code Rule No. 20.

12-26.2 **Automatic Extinguishers.** Dip tanks, drain boards, drip pans and drip troughs involving the use of flammable liquids shall be provided with approved automatic fire extinguishers except:

a. Those used in electrostatic finishing.

b. Hand dipping tanks which with their associated drain boards, drip pans and drip troughs have a vapor surface area not greater than 16 square feet.

12-26.3 **Hand Extinguishers.** There shall be provided adjacent to the inside or outside of each required exit from the room in which flammable liquids are being applied or stored at least one hand fire extinguisher approved for the control of flammable liquid fires. Extinguishers containing carbon tetrachloride, methyl bromide or other toxic material are prohibited for this usage. In addition there shall be at least one approved extinguisher for each 2500 square feet of floor area so located that a person shall not have to travel more than 50 feet to reach the nearest extinguisher. Extinguishers shall be easily accessible and protected from injury.

12-27 EVIDENCE OF DANGEROUS AIR CONTAMINANTS

The existence of air contaminants consisting of or deriving from the substances named in the following table in relative quantities greater than those set forth as to each substance shall constitute prima-facie evidence that such contaminants are dangerous air contaminants. Prima-facie evidence as to whether other air contaminants or lesser concentrations than those set forth in the following table constitute dangerous air contaminants by reason of their existence in quantities tending to injure the health of employees shall include an opinion by a physician to that effect as a matter of sound clinical judgment.

GASES AND VAPORS

<i>A.</i> <i>Substance</i>	<i>Parts</i> <i>per</i> <i>Million</i>	<i>A.</i> <i>Substance</i>	<i>Parts</i> <i>per</i> <i>Million</i>
Acetaldehyde	200	Dichlorodifluoromethane	1000
Acetic acid	10	1, 1-Dichloroethane	100
Acetic anhydride	5	1, 2-Dichloroethylene	200
Acetone	1000	Dichloroethyl ether	15
Aerolein	0.5	Dichloromonofluoromethane ..	1000
Acrylonitrile	20	1, 1-Dichloro -1- nitroethane ..	10
Allyl alcohol	5	Dichlorotetrafluoroethane	1000
Allyl propyl disulfide	2	Diethylamine	25
Ammonia	100	Difluorodibromomethane	100
Amyl acetate	200	Diisobutyl ketone	50
Amyl alcohol (isoamyl alcohol)	100	Dimethylaniline	5
Aniline	5	Dimethylsulfate	1
Arsine	0.05	Dioxane (diethylene dioxide) ..	100
Benzene (Benzol)	25	Ethyl acetate	400
Benzyl chloride	1	Ethyl alcohol (ethanol)	1000
Bromine	1	Ethylamine	25
Butadiene	1000	Ethyl benzene	200
Butanone (methyl ethyl ketone)	250	Ethyl bromide	200
Butyl acetate	200	Ethyl chloride	1000
Butyl alcohol	100	Ethyl ether	400
Butyl amine	5	Ethyl formate	100
Butyl cellosolve	200	Ethyl mercaptan	250
Butyl mercaptan	10	Ethyl silicate	100
Carbon dioxide	5000	Ethylene chlorohydrin	5
Carbon disulfide	20	Ethylene diamine	10
Carbon monoxide	100	Ethylene dibromide	25
Carbon tetrachloride	25	Ethylene dichloride	100
Cellosolve	200	Ethylene imine	5
Cellosolve acetate	100	Ethylene oxide	100
Chlorine	1	Fluorine	0.1
Chlorine trifluoride	0.1	Fluorotrichloromethane	1000
Chlorobenzene (monochloro-benzene)	75	Formaldehyde	5
Chloroform	100	Furfural	5
1-chloro -1- nitropropane	20	Furfuryl alcohol	200
Chloroprene	25	Gasoline	500
Cresol (all isomers)	5	Heptane	500
Cyclohexane	400	Hexane	500
Cyclohexanol	100	Hexanone	100
Cyclohexanone	100	Hexone	100
Cyclohexene	400	Hydrazine	1
Cyclopropane	400	Hydrogen bromide	5
Diacetone alcohol	50	Hydrogen chloride	5
Diborane	0.1	Hydrogen cyanide	10
o-Dichlorobenzene	50	Hydrogen fluoride	3
		Hydrogen peroxide	1

<i>A.</i> <i>Substance</i>	<i>Parts per Million</i>	<i>A.</i> <i>Substance</i>	<i>Parts per Million</i>
Hydrogen selenide	0.05	Pentane	1000
Hydrogen sulfide	20	Pentanone	200
Iodine	1	Perehloromethyl mercaptan..	0.1
Isophlorone	25	Perehloroethylene	200
Isopropylamine	5	Phenol	5
Mesityl oxide	50	Phenylhydrazine	5
Methyl acetate	200	Phosgene (carbonyl chloride)..	1
Methyl acetylene	1000	Phosphine	0.05
Methyl alcohol	200	Phosphorus trichloride	0.5
Methyl bromide	20	Propyl acetate	200
Methyl cellosolve	25	Propyl alcohol (isopropyl al- cohol)	400
Methyl cellosolve acetate.....	25	Propyl ether (isopropyl ether)	500
Methyl chloride	100	Propylene dichloride	75
Methyl isobutyl carbinol (me- thyl amyl alcohol).....	25	Propylene imine	25
Methyl mercaptan	50	Pyridine	10
Methylal (dimethoxymethane)	1000	Quinone	0.1
Methyl chloroform	500	Stibine	0.1
Methyleyclohexane	500	Stoddard solvent	500
Methyleyclohexanol	100	Styrene monomer (phenyl ethylene)	200
Methyleyclohexanone	100	Sulfur dioxide	10
Methyl formate	100	Sulfur hexafluoride	1000
Methylene chloride ...	500	Sulfur monochloride	1
Naptha (coal tar).....	200	Sulfur pentafluoride	0.025
Naptha (petroleum)	500	p-Tertiary butyl toluene.....	10
Nickel carbonyl	0.001	1, 1, 2, 2-Tetrachloroethane...	5
p-Nitroaniline	1	Tetrahydrofuran	200
Nitrobenzene	1	Tetranitromethane	1
Nitroethane ..	100	Toluene	200
Nitrogen dioxide	5	o-Toluidine	5
Nitroglycerin	0.5	Trichloroethylene	200
Nitromethane	100	Trifluoromonobromomethane .	1000
2-Nitropropane	50	Turpentine	100
Nitrotoluene	5	Vinyl chloride (chloroethene)	500
Octane	500	Xylene	200
Ozone	0.1		

TOXIC DUSTS, FUMES AND MISTS

<i>B.</i> <i>Substance</i>	<i>Milligrams per Cubic Meter</i>	<i>B.</i> <i>Substance</i>	<i>Milligrams per Cubic Meter</i>
Aldrin	0.25	Manganese	6
Ammate	15	Mercury	0.1
Antimony	0.5	Methoxychlor	15
Arsenic	0.5	Molybdenum (soluble com- pounds)	5
Barium (Soluble compounds) ..	0.5	Molybdenum (insoluble com- pounds)	15
Cadmium	0.1	Organo mercurials (as mer- cury)	0.01
Calcium arsenate	0.3	Parathion	0.1
Chlordane	2	Pentachloronaphthalene	0.5
Chlorinated diphenyl oxide...	0.5	Pentachlorophenol	0.5
Chlorodiphenyl	1	Phosphorus (yellow)	0.1
Chromic acid and chromates as Cr ⁶⁺	0.1	Phosphorus pentachloride ...	1
Crag Herbicide	15	Phosphorus pentasulfide	1
Cyanide as CN	5	Pieric acid.....	0.1
2, 4-D (2, 4-dichlorophenoxy- acetic acid)	10	Selenium compounds (as Se) ..	0.1
DDT (2, 2- bis- (p-chloro- phenyl)-1, 1, 1-trichloroethane)	1	Sodium hydroxide	2
Dieldrin	0.25	Sulfuric acid	1
Dinitrotoluene	1.5	TEDP (tetraethyl dithiono pyrophosphate)	0.2
Dinitro-o-cresol	0.2	Tellurium	0.1
EPN (ethyl-p-nitrophenyl thi- ono benzene phosphonate) ..	0.5	TEPP (tetraethyl pyrophos- phate)	0.05
Ferro vanadium dust	1	Tetryl (2, 4, 6-trinitrophenyl- methylnitramine)	1.5
Fluoride	2.5	Titanium dioxide	15
Hydroquinone	2	Trichloronaphthalene	5
Iron oxide fume	15	Trinitrotoluene	1.5
Lead	0.20	Vanadium (V ₂ O ₅ dust).....	0.5
Lead arsenate	0.2	Vanadium (V ₂ O ₅ fume)....	0.1
Lindane	0.5	Zinc oxide fume (as Zn).....	15
Magnesium oxide fume	15	Zirconium	5
Malathion	15		