



DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS
DIRECTOR'S OFFICE
OCCUPATIONAL HEALTH STANDARDS

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(By authority conferred on the director of the department of consumer and industry services by section 24 of 1974 PA 154, MCL 408.1024, and Executive Reorganization Order Nos. 1996-1 and 1996-2, MCL 330.3101 and 445.2001)

R 325.50101, R 325.50102, R 325.50117, R 325.50118, R 325.50124, R 325.50125, and R 325.50136 of the Michigan Administrative Code are amended as follows:

PART 314. COKE OVEN EMISSIONS

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R 325.50101 Definitions; A to E.

Rule 101. As used in these rules:

- (a) **“Authorized person”** means a person specifically required by the employer to enter a regulated area or a person entering a regulated area as a designated representative of employees for the purpose of observing the monitoring and measuring procedures under R 325.50135.
- (b) **“Beehive oven”** means a coke oven in which the products of carbonization other than coke are not recovered, but are released into the ambient air.

- (c) **“Coke oven”** means a retort in which coke is produced by the destructive distillation or carbonization of coal.
- (d) **“Coke oven battery”** means a structure containing a number of slot-type coke ovens.
- (e) **“Coke oven emissions”** means the soluble fraction of total particulate matter present during the destructive distillation or carbonization of coal for the production of coke as determined by benzene extraction or an equivalent analytical method.
- (f) **“Director”** means the director of the Michigan department of consumer and industry services or his or her authorized representative.

- (g) **“Emergency”** means an occurrence, such as, but not limited to, equipment failure, that is likely to, or does, result in a massive release of coke oven emissions.
- (h) **“Existing coke oven battery”** means a battery which is in operation or under construction on January 20, 1977, and which is not a rehabilitated coke oven battery.

R 325.50102 Definitions; G to S.

Rule 102. As used in these rules:

- (a) **“Green push”** means coke that, when removed from the oven, results in emissions due to the presence of incompletely coked coal.
- (b) **“O.H. rule”** means an occupational health rule adopted by reference in accordance with section 14 of 1974 PA 154, MCL 408.1014. Copies of these rules are available from the Michigan department of consumer and industry services.
- (c) **“Pipeline charging”** means an apparatus used to introduce coal into an oven which uses a pipe or duct permanently mounted onto an oven and through which coal is charged.
- (d) **“Rehabilitated coke oven battery”** means a battery that is rebuilt, overhauled, renovated, or restored from the pad up after January 20, 1977.
- (e) **“Sequential charging”** means a procedure, usually automatically timed, by which a predetermined volume of coal in each larry car hopper is introduced into an oven so that not more than 2 hoppers commence or finish discharging simultaneously although, at some point, all hoppers are discharging simultaneously.
- (f) **“Stage charging”** means a procedure by which a predetermined volume of coal in each larry car hopper is introduced into an oven so that not more than 2 hoppers are discharging simultaneously.

R 325.50103 Permissible exposure limits.

Rule 103. An employer shall assure that an employee in the regulated area is not exposed to coke oven emissions at concentrations greater than 150 micrograms per cubic meter of air (150 ug/m³), averaged over any 8-hour period.

R 325.50104 Regulated areas.

Rule 104. An employer shall establish the following regulated areas and shall limit access to them to authorized persons:

- (a) The coke oven battery, including topside and its machinery, pushside and its machinery, coke side and its machinery, and the battery ends, the wharf, and the screening station.
- (b) The beehive oven and its machinery.

R 325.50105 Exposure monitoring and measurements; accuracy of methods; notifications to employees; corrective actions.

Rule 105. (1) An employer who has a place of employment where coke oven emissions are present shall monitor employees working in the regulated area to measure their exposure to coke oven emissions.

(2) An employer shall obtain measurements which are representative of each employee's exposure to coke oven emissions over an 8-hour period. All measurements shall determine exposure without regard to the use of respiratory protection.

(3) An employer shall collect full-shift (for not less than 7 continuous hours) personal samples, or shall employ other equivalent monitoring procedures, including at least 1 sample

during each shift for each battery and each job classification, including maintenance personnel, within the regulated areas.

(4) An employer shall repeat the monitoring and measurements required by this rule at least once every 3 months.

(5) If a production, process, or control change is made which may result in new or additional exposure to coke oven emissions, or whenever the employer has any other reason to suspect an increase in employee exposure, the employer shall repeat the monitoring and measurements required by this rule for those employees affected by such change or suspected increase.

(6) An employer shall use a method of monitoring and measurement which has an accuracy (with a confidence level of 95%) of not less than plus or minus 35% for concentrations of coke oven emissions greater than, or equal to, 150 ug/m³.

(7) An employer shall provide written notice to each employee of the exposure measurements which represent that employee's exposure within 5 working days after the receipt of the results of measurements required by this rule.

(8) If exposure measurements indicate that the representative employee exposure exceeds the permissible exposure limit, the employer shall, in such notification, inform each employee of that fact and of the corrective action being taken to reduce exposure to or below the permissible exposure limit.

R 325.50106 Compliance programs.

Rule 106. (1) An employer shall establish and implement a written program to reduce exposures to coke oven emissions solely by means of the engineering and work practice controls required in Rules 107 to 116.

(2) The written program shall include, at least the following:

- (a) A description of each coke oven operation by battery, including, work force and operating crew, coking time, operating procedures, and maintenance practices.
- (b) Engineering plans and other studies used to determine the controls for the coke battery.
- (c) A report of the technology considered in meeting the permissible exposure limit.
- (d) A monitoring program in accordance with Rule 105.
- (e) A detailed schedule for the implementation of the engineering and work practice controls required in Rules 110, 111, and 112.
- (f) Other relevant information.

(3) If, after implementing all controls required by Rules 110, 111, and 112 or after completion of a new or rehabilitated battery, the permissible exposure limit is still exceeded, an employer shall develop a detailed written program and schedule for the implementation of any additional engineering controls and work practices necessary to reduce exposure to or below the permissible exposure limit.

(4) A written plan for a compliance program shall be submitted, upon request, to the director and shall be available at the worksite for examination and copying by the director, the employee, and the authorized representative. The plan shall be revised and updated at least once every 6 months to reflect the current status of the program.

R 325.50107 Methods of compliance; existing coke oven batteries.

Rule 107. (1) An employer shall institute the engineering and work practice controls listed in Rules 110, 111, and 112 in existing coke oven batteries at the earliest possible time, but not later than January 20, 1980, except to the extent that the employer can establish that such controls are not feasible.

(2) If, after implementing all controls required by Rules 110, 111, and 112 or after January 20, 1980, whichever is sooner, employee exposures still exceed the permissible exposure limit, an employer shall implement any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible.

(3) Where the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, an employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by use of respiratory protection which complies with the requirements of Rules 117 to 119.

R 325.50108 Methods of compliance; new or rehabilitated coke oven batteries.

Rule 108. (1) An employer shall institute the best available engineering and work practice controls on all new or rehabilitated coke oven batteries to reduce and maintain employee exposure at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible.

(2) If, after implementing the best available engineering and work practice controls required by these rules, employee exposures still exceed the permissible exposure limit, an employer shall implement any other engineering and work practice controls necessary to reduce exposure to or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible.

(3) If the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, an employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of Rules 117 to 119.

R 325.50109 Methods of compliance; beehive ovens.

Rule 109. (1) An employer shall institute engineering and work practice controls on beehive ovens at the earliest possible time to reduce and maintain employee exposures at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible.

(2) If, after implementing all engineering and work practice controls required by Rule 109(1), employee exposures still exceed the permissible exposure limit, an employer shall implement any other engineering and work practice controls necessary to reduce exposures to or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible.

(3) If the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, an employer shall nonetheless use them to reduce exposure to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of Rules 117 to 119.

R 325.50110 Existing coke oven battery; engineering controls during charging operations.

Rule 110. (1) An employer shall equip and operate existing coke oven batteries with all of the following engineering controls to control coke oven emissions during charging operations:

- (a) One of the following methods of charging:
 - (i) Stage charging as described in Rule 113(2).
 - (ii) Sequential charging as described in Rule 113(2), except that Rule 113(2)(b)(iv) does not apply to sequential charging.
 - (iii) Pipeline charging or other forms of enclosed charging in accordance with Rule 110(1), except Rules 110(1), (b), (d), (e), (f), and (h) do not apply.
- (b) Drafting from 2 or more points in the oven being charged, through the use of double collector mains or a fixed or moveable jumper pipe system to another oven, to effectively remove the gases from the oven to the collector mains.
- (c) Aspiration systems designed and operated to provide sufficient negative pressure and flow volume to effectively move the gases evolved during charging into the collector mains, including sufficient steam pressure, and steam jets of sufficient diameter.
- (d) Mechanical volumetric controls on each larry car hopper to provide the proper amount of coal to be charged through each charging hole so that the tunnel head will be sufficient to permit the gases to move from the oven into the collector mains.
- (e) Devices to facilitate the rapid and continuous flow of coal into the oven being charged, such as stainless steel liners, coal vibrators, or pneumatic shells.
- (f) Individually operated larry car dropsleeves and slidegates or equivalent charge systems designed and maintained so that the gases are effectively removed from the oven into the collector mains.
- (g) Mechanized gooseneck and standpipe cleaners.
- (h) Air seals on the pusher machine leveler bars to control air infiltration during charging.
- (i) Roof carbon cutters or a compressed air system or both on the pusher machine rams to remove roof carbon.

R 325.50111 Existing coke oven battery; engineering controls during coking operations.

Rule 111. An employer shall control coke oven emissions from existing coke oven batteries during coking operations by:

- (a) A pressure control system on each battery to obtain uniform collector main pressure.
- (b) Ready access to door repair facilities to facilitate the prompt and efficient repair of doors, door sealing edges, and all door parts.
- (c) An adequate number of spare doors available for replacement purposes.
- (d) Chuck door gaskets to control chuck door emissions until such door is repaired or replaced.
- (e) Heat shields on door machines.

R 325.50112 Filtered air.

Rule 112. (1) An employer shall provide positive pressure, temperature-controlled filtered air for larry car, pusher machine, door machine, and quench car cabs.

(2) An employer shall provide standby pulpits equipped with positive-pressure, temperature-controlled filtered air on the battery topside, at the wharf, and at the screening station.

R 325.50113 Work practice controls; charging.

Rule 113. (1) An employer shall establish and implement a detailed, written inspection and cleaning procedure for the charging of existing coke oven batteries consisting of at least the following elements:

- (a) Prompt and effective repair or replacement of all engineering controls.
- (b) Inspection and cleaning of goosenecks and standpipes prior to each charge to a specified minimum diameter sufficient to effectively move the evolved gases from the oven to the collector mains.
- (c) Inspection for roof carbon buildup prior to each charge and removal of roof carbon as necessary to provide an adequate gas channel so that the gases can effectively move from the oven into the collector mains.
- (d) Inspection of the steam aspiration system prior to each charge so that sufficient pressure and volume are maintained to effectively move the gases from the oven to the collector mains.
- (e) Inspection of steam nozzles and liquor sprays prior to each charge and cleaning as necessary so that the steam nozzles and liquor sprays are clean.
- (f) Inspection of standpipe caps prior to each charge and cleaning and luting, or both, as necessary so that the gases can effectively move from the oven to the collector mains.
- (g) Inspection of charging holes and lids for cracks, warpage, and other defects prior to each charge and removal of carbon to prevent emissions, and application of luting material to standpipe and charging hole lids where necessary to obtain a proper seal.

(2) An employer shall establish and implement a detailed written charging procedure, designed and operated to eliminate emissions during charging for each battery, consisting of at least the following:

- (a) Larry car hoppers filled with coal to a predetermined level in accordance with the mechanical volumetric controls required under Rule 110(d) so as to maintain a sufficient gas passage in the oven to be charged.
- (b) The larry car aligned over the oven to be charged so that the dropsleeves fit tightly over the charging holes.
- (c) The oven charged in accordance with the following sequence of requirements:
 - (i) The aspiration system shall be turned on.
 - (ii) The coal shall be charged through the outermost hoppers, either individually or together, depending on the capacity of the aspiration system to collect the gases involved.
 - (iii) The charging holes used under Rule 113(2)(a)(ii) relidded or otherwise sealed off to prevent leakage of coke oven emissions.
 - (iv) If 4 hoppers are used, the third hopper shall be discharged and relidded or otherwise sealed off to prevent leakage of coke oven emissions.
 - (v) The final hopper shall be discharged until the gas channel at the top of the oven is blocked and then the chuck door shall be open and the coal leveled.
 - (vi) If the coal from the final hopper is discharged and the leveling operation complete, the charging hole shall be relidded or otherwise sealed off to prevent leakage of coke oven emissions.
 - (vii) The aspiration system shall be turned off only after the charging holes have been closed.

(3) An employer shall establish and implement a detailed written charging procedure, designed and operated to eliminate emissions during charging of each pipeline or enclosed charged battery.

R 325.50114 Work practice controls; coking.

Rule 114. An employer shall establish and implement a detailed written coking procedure for existing coke oven batteries consisting of at least the following elements:

- (a) Checking oven back pressure controls to maintain uniform pressure conditions in the collecting main.
- (b) Repair, replacement, and adjustment of oven doors and chuck doors, and replacement of door jambs to provide a continuous metal-to-metal fit.
- (c) Cleaning of oven doors, chuck doors, and door jambs after each coking cycle to provide an effective seal.
- (d) An inspection system and corrective action program to control door emissions to the maximum extent possible.
- (e) Luting of doors that are sealed by luting after each coking cycle and reluting, replacing, or adjusting as necessary to control leakage.

R 325.50115 Work practice controls; pushing.

Rule 115. An employer shall control coke oven emissions during pushing operations by quenching coke and coal spillage as soon as practicable and not shoveling them into a heated oven, and by a detailed written procedure for each battery established and implemented for the control of emissions during pushing consisting of the following elements:

- (a) Dampering off the ovens and removal of charging hole lids to effectively control coke oven emissions during the push.
- (b) Heating the coal charge uniformly for a sufficient period to obtain proper coking, including the prevention of green pushes.
- (c) Prevention of green pushes to the maximum extent possible.
- (d) Inspection, adjustment, and correction of heating flue temperatures and effective flues at least once weekly and after any green push, to prevent green pushes.
- (e) Cleaning of heating flues and related equipment at least once weekly and after any green push to prevent green pushes.

R 325.50116 Work practice controls; maintenance and repair.

Rule 116. An employer shall establish and implement a detailed written procedure of maintenance for existing coke oven batteries which shall consist of the following elements:

- (a) Regular inspection of all controls, including goosenecks, standpipes, standpipe caps, charger hole lids and castings; regular inspection of jumper standings, jumper pipes, and air seals for cracks, misalignment, or other defects; and prompt implementation of the necessary repairs.
- (b) Maintaining the regulated area in a neat, orderly condition free of coal and coke spillage and debris.
- (c) Regular inspection of the damper system, aspiration system, and collector main for cracks or leakage, and prompt implementation of the necessary repairs.
- (d) Regular inspection of the heating system and prompt implementation of the necessary repairs.
- (e) Prevention of miscellaneous fugitive topside emissions.
- (f) Regular inspection and patching of oven brickwork.

- (g) Maintenance of battery equipment and controls in good working order.
- (h) Maintenance and repair of coke oven doors, chuck doors, door jams and seals.
- (i) Installation of chuck door gaskets prior to the next coking cycle.
- (j) Instituting and completing repairs as soon as possible, including temporary repair measures instituted and completed where necessary, which include, but are not limited to, the requirements of subrules (e) and (i) of this rule.

R 325.50117 Respiratory protection.

Rule 117. (1) If respiratory protection is required under these rules, then an employer shall provide, and assure the use of, respirators that comply with the requirements of R 325.60051 et seq. and these rules. An employer shall not use respirators to achieve compliance with the permissible exposure limit, except during any of the following:

- (a) Periods necessary to install or implement feasible engineering and work practice controls.
- (b) Work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the permissible exposure limit.
- (c) Work operations such as maintenance and repair activity in which engineering and work practice controls are not technologically feasible.
- (d) Emergencies.

(2) If respirators are required, then an employer shall select, provide, and assure the use of, the appropriate respirator or combination of respirators on the basis of the table 1:

(3) If a respirator is required by this rule for concentrations that are not more than 1500 µg/m³, an employer shall provide, at the option of each affected employee, either a particulate filter respirator or a powered air-purifying respirator as described in table 1.

**Table 1.
Respiratory Protection for Coke Oven Emissions**

Airborne Concentration of Coke Oven Emissions	Approved Respirator
(a) Any concentration	(1) A type C supplied-air respirator operated in pressure demand or other positive pressure or continuous flow mode; or (2) A powered air-purifying particulate filter respirator for dust and mist; or (3) A powered air-purifying particulate filter respirator or combination chemical cartridge and particulate filter respirator for coke oven emissions.
(b) Concentrations not more than 1500 µg/m ³	(1) Any particulate filter respirator for dust and mist, except single-use respirator; or (2) Any particulate filter respirator or combination chemical cartridge and particulate filter respirator for coke oven emissions; or (3) Any respirator listed in this rule.

R 325.50118 Protective clothing and equipment; provision and use.

Rule 118. An employer shall provide, and assure the use of, appropriate protective clothing and equipment, such as, but not limited to, all of the following:

- (a) Flame-resistant jacket and pants.
- (b) Flame-resistant gloves.
- (c) Devices that insulate footwear from hot surfaces.
- (d) Face shields or vented goggles that comply with R 408.13310 et seq. of the Michigan Administrative Code administered and enforced by the Michigan department of consumer and industry services.
- (e) Safety shoes that comply with R 408.13301 et seq. of the Michigan Administrative Code administered and enforced by the Michigan department of consumer and industry services.
- (f) Protective helmets that comply with the general industry rule R 408.13301 et seq. of the Michigan Administrative Code administered and enforced by the Michigan department of consumer and industry services.

R 325.50119 Protective clothing and equipment; cleaning and replacement.

Rule 119. Where protective clothing is required by these rules, an employer shall do all of the following:

- (a) Provide the protective clothing required by Rule 118(a) and (b) in a clean and dry condition at least once weekly.
- (b) Clean, launder, or dispose of protective clothing required by Rule 118(a) and (b).
- (c) Repair or replace the protective clothing and equipment as needed to maintain their effectiveness.
- (d) Assure that all protective clothing is removed at the completion of a work shift and only in change rooms required by these rules
- (e) Assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closable container in the change room.
- (f) Inform any person who cleans or launders protective clothing required by this rule of the potentially harmful effects of exposure to coke oven emissions.

R 325.50120 Emergencies.

Rule 120. If an emergency occurs, the next coking cycle shall not begin until the cause of the emergency is determined and corrected, unless the employer can establish that it is necessary to initiate the next coking cycle in order to determine the cause of the emergency.

R 325.50121 Hygiene facilities and practices; change rooms, showers, and lavatories.

Rule 121. (1) An employer shall provide clean change rooms equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment whenever employees are required to wear protective clothing and equipment in accordance with Rule 118.

(2) An employer shall assure that employees working in a regulated area shower at the end of the work shift.

(3) An employer shall provide shower facilities in accordance with O.H. rule 4201(4), Sanitation – washing facilities.

(4) An employer shall assure that employees working in the regulated area wash their hands and face prior to eating.

(5) An employer shall provide lavatory facilities in accordance with O.H. rule 4201(4), Sanitation – washing facilities.

(6) An employer shall provide lunchroom facilities which have a temperature controlled, positive-pressure, filtered air supply, and which are readily accessible to employees working in the regulated area.

R 325.50122 Acts prohibited in regulated areas.

Rule 122. (1) An employer shall assure that in a regulated area, food or beverages are not present or consumed, smoking products are not present or used, and cosmetics are not applied, except that these activities may be conducted in the lunchrooms, change rooms, and showers required by these rules.

(2) Drinking water may be consumed in a regulated area.

R 325.50123 Medical surveillance; general requirements.

Rule 123. (1) An employer shall institute a medical surveillance program for all employees who are employed in a regulated area for not less than 30 days per year.

(2) This program shall provide that medical examinations and procedures in accordance with Rule 123(1) be made available, at the employer's cost, to each employee during scheduled working hours or at other times agreeable to both the employee and the employer.

(3) An employer shall inform an employee who refuses a required medical examination of the possible health consequences of such refusal and shall obtain a signed statement from the employee indicating that the employee understands the risk involved in the refusal to be examined.

(4) An employer shall assure that all medical examinations and procedures are performed by, or under the supervision of, a licensed physician.

R 325.50124 Medical surveillance; initial examinations.

Rule 124. At the time of initial assignment to a regulated area or upon the institution of the medical surveillance program, an employer shall provide a medical examination for employees covered under R 325.50123(1) that includes at least all of the following elements:

- (a) A work history and medical history that includes smoking history and the presence and degree of respiratory symptoms, such as breathlessness, cough, sputum production, and wheezing.
- (b) A 14 by 17-inch posterior-anterior chest x-ray film. An international labor office UICC/Cincinnati (ILO U/C) rating is recommended.
- (c) Pulmonary function tests, including forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV 1.0). The employer shall record the type of equipment used to perform the tests.

- (d) Weight.
- (e) A skin examination.
- (f) Urinalysis for sugar, albumin, and hematuria.
- (g) A urinary cytology examination.

R 325.50125 Medical surveillance; periodic examinations.

Rule 125. (1) An employer shall provide the examinations specified in R 325.50124(a) to (f) at least annually for employees covered under R 325.50123(1).

(2) An employer shall provide the examinations specified in R 325.50124 (a) and (c) to (g) at least once semiannually for employees who are 45 years of age or older or who have 5 or more years of employment in the regulated area.

(3) If an employee who is 45 years of age or older, or who has 5 or more years of employment in the regulated area, transfers or is transferred from employment in a regulated area, then the employer shall continue to provide the examinations specified in R 325.50124(a) to (g) once semiannually as long as the employee is employed by the same employer or a successor employer.

(4) If an employee has not taken the examinations specified in subrules (1) to (3) of this rule within the 6 months preceding the termination of employment, then the employer shall provide the examinations to the employee upon termination of employment.

R 325.50126 Medical surveillance; information provided to physicians.

Rule 126. An employer shall provide all of the following information to the examining physician:

- (a) A copy of these rules, the substance information sheet, and the air monitoring and medical surveillance guide for coke oven emissions.
- (b) A description of the affected employee's duties as they relate to the employee's exposure.
- (c) The employee's exposure level or estimated exposure level.
- (d) A description of any personal protective equipment used or to be used.
- (e) Information from previous medical examinations of the affected employee which is not readily available to the examining physician.

R 325.50127 Medical surveillance; physician's written opinions.

Rule 127. (1) An employer shall obtain a written opinion from the examining physician, which shall include all of the following:

- (a) The results of the medical examinations.
- (b) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from exposure to coke oven emissions.
- (c) Any recommended limitations upon the employees' exposure to coke oven emissions or upon the use of protective clothing or equipment such as respirators.
- (d) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further explanation or treatment.

(2) An employer shall instruct the physician not to reveal in the written opinion specific findings or diagnoses unrelated to occupational exposure.

(3) An employer shall provide a copy of the written opinion to the affected employee.

R 325.50128 Employee information and training.

Rule 128. (1) An employer shall institute a training program for employees who are employed in a regulated area and shall assure their participation.

(2) The training program shall be provided as of the effective date of these rules for employees who are employed in the regulated area at that time or at the time of initial assignment to a regulated area.

(3) The training program shall be provided at least annually for all employees who are employed in the regulated area, except that training regarding the occupational safety and health hazards associated with exposure to coke oven emissions and the purpose, proper use, and limitations of respiratory protective devices shall be provided at least quarterly for the first year after the initiation of the training program.

(4) The training program shall include informing each employee of all of the following:

- (a) The information contained in the substance information sheet for coke oven emissions.
- (b) The purpose, proper use, and limitations of respiratory protective devices required in accordance with Rules 117 to 119.
- (c) The purpose for and a description of the medical surveillance program required by Rules 123 to 127, including information on the occupational safety and health hazards associated with exposure to coke oven emissions.
- (d) A review of all written procedures and schedules required under Rules 106 to 116.
- (e) A review of these rules.

R 325.50129 Access to training materials.

Rule 129. (1) An employer shall make a copy of these rules, the substance information sheet, and the air monitoring and medical surveillance guide for coke oven emissions readily available to all persons employed in the regulated area.

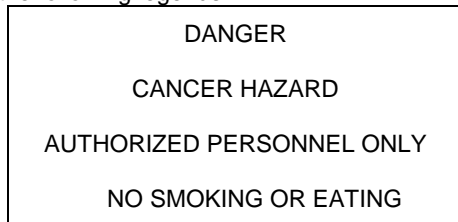
(2) An employer shall provide, upon request, all materials relating to the employee information and training program to the director.

R 325.50130 Precautionary signs and labels.

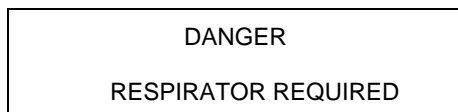
Rule 130. (1) An employer shall assure that a statement does not appear on or near any sign required by these rules which contradicts or detracts from the effects of the required sign.

(2) An employer shall assure that signs required by these rules are illuminated and cleaned as necessary so that the legend is readily visible.

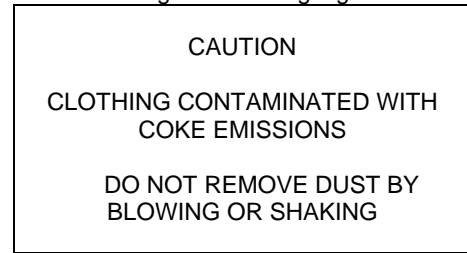
(3) An employer shall post signs in the regulated area bearing the following legends:



(4) In addition, the employer shall post signs in the areas where the permissible exposure limit is exceeded bearing the legend:



(5) The employer shall apply precautionary labels to all containers of protective clothing contaminated with coke oven emissions bearing the following legend:

**R 325.50131 Exposure measurements.**

Rule 131. (1) An employer shall establish and maintain an accurate record of all measurements taken to monitor employee exposure to coke oven emissions required in Rule 105. The record shall include all of the following:

- (a) Name, social security number, and job classification of the employees monitored.
- (b) The date or dates, number, duration, and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable.
- (c) The type of respiratory protective devices worn, if any.
- (d) A description of the sampling and analytical methods used and evidence of their accuracy.
- (e) The environmental variables that could affect the measurement of employee exposure.

(2) An employer shall maintain this record for not less than 40 years or for the duration of employment plus 20 years, whichever period is longer.

R 325.50132 Medical records.

Rule 132. (1) An employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by Rule 123(1). The record shall include all of the following:

- (a) The name, social security number, and description of duties of the employee.
- (b) A copy of the physician's written opinion.
- (c) The signed statement of any refusal to take a medical examination under Rule 123(3).
- (d) Any employee medical complaints related to exposure to coke oven emissions.

(2) An employer shall keep, or assure that the examining physician keeps, all of the following medical records:

- (a) A copy of the medical examination results, including medical and work history required under Rule 124(1)(a).
- (b) A description of the laboratory procedures used and a copy of any standards or guidelines used to interpret the test results.
- (c) The initial X-ray film.
- (d) The X-ray films for the most recent 5 years.
- (e) Any X-ray film with a demonstrated abnormality and all subsequent films.
- (f) The initial cytologic examination slide and written description.
- (g) The cytologic examination slides and written descriptions for the most recent 10 years.
- (h) Any cytologic examination slides with demonstrated atypia, if such atypia persists for 3 years, and all subsequent slides and written descriptions.

(3) The employer shall maintain medical records required under this rule for not less than 40 years, or for the duration of employment plus 20 years, whichever period is longer.

R 325.50133 Availability of records.

Rule 133. (1) An employer shall make available upon request all records required to be maintained by Rules 131 to 132 to the director for examination and copying.

(2) An employer shall make available, upon request, records of employee exposure measurements required by Rule 131 for inspection and copying to affected employees and their designated representatives.

(3) An employer shall make available upon request employee medical records required to be maintained by Rule 132 to a physician designated by the affected employee or former employee.

(4) An employer shall make available upon request records of employee exposure measurements required by Rule 131 for inspection and copying to former employees and their designated representatives which indicate the former employees' own exposures.

R 325.50134 Transfer of records.

Rule 134. (1) If an employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by Rules 131 and 132

(2) If an employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, these records shall be transmitted by registered mail to the director.

(3) At the expiration of the retention period for the records required to be maintained under Rules 131 and 132, an employer shall transmit the records by registered mail to the director or shall continue to retain such records.

R 325.50135 Observations of monitoring.

Rule 135. (1) An employer shall provide affected employees or their representatives an opportunity to observe any measuring or monitoring of employee exposure to coke oven emissions conducted pursuant to Rule 105.

(2) If observation of the measuring or monitoring of employee exposure to coke oven emissions requires entry into an area where the use of protective clothing or equipment is required, an employer shall provide the observer with, and assure the use of, such equipment and shall require the observer to comply with all other applicable safety and health procedures.

(3) Without interfering with the measurement, an observer shall be entitled to all of the following:

- (a) An explanation of the measurement procedures.
- (b) Observe all steps related to the measurement of coke oven emissions performed at the place of exposure.
- (c) Record the results obtained.

R 325.50136 Availability of rules, information sheets, and guides.

Rule 136. (1) A copy of these rules, the substance information sheet, and the air monitoring and medical surveillance guides for coke oven emissions shall be provided to each employer by the Michigan Department of Consumer and Industry Services, P.O. Box 30643, Lansing, Michigan 48909.

(2) Permission to reproduce each or all of these documents in full is granted by the director.

APPENDIX A — COKE OVEN EMISSIONS SUBSTANCE INFORMATION SHEET

I. SUBSTANCE IDENTIFICATION

A. Substance: Coke Oven Emissions

B. Definition: The benzene-soluble fraction of total particulate matter present during the destructive distillation or carbonization of coal for the production of coke.

C. Permissible Exposure Limit: 150 micrograms per cubic meter of air determined as an average over an 8-hour period.

D. Regulated areas: Only employees authorized by your employer should enter a regulated area. The employer is required to designate the following areas as regulated areas: the coke oven battery, including topside and its machinery, pushside and its machinery, cokeside and its machinery, and the battery ends; the screening station; and the wharf; and the beehive ovens and their machinery.

II. HEALTH HAZARD DATA

Exposure to coke oven emissions is a cause of lung cancer, and kidney cancer, in humans. Although there have not been an excess number of skin cancer cases in humans, repeated skin contact with coke oven emissions should be avoided.

III. PROTECTIVE CLOTHING AND EQUIPMENT

A. Respirators: Respirators will be provided by your employer for routine use if your employer is in the process of implementing engineering and work practice controls or where engineering and work practice controls are not feasible or insufficient to reduce exposure to or below the PEL. You must wear respirators for non-routine activities or in emergency situations where you are likely to be exposed to levels of coke oven emissions in excess of the permissible exposure limit. Until January 20, 1978, the routine wearing of respirators is voluntary. Until that date, if you choose not to wear a respirator you do not have to do so. You must still have your respirator with you and you must still wear it if you are near visible emissions. Since how well your respirator fits your face is very important, your employer is required to conduct fit tests to make sure the respirator seals properly when you wear it. These tests are simple and rapid and will be explained to you during your training sessions.

B. Protective clothing: Your employer is required to provide, and you must wear, appropriate, clean, protective clothing and equipment to protect your body from repeated skin contact with coke oven emissions and from the heat generated during the coking process. This clothing should include such items as jacket and pants and flame resistant gloves. Protective equipment should include face shield or vented goggles, protective helmets and safety shoes, insulated from hot surfaces where appropriate.

IV. HYGIENE FACILITIES AND PRACTICES

You must not eat, drink, smoke, chew gum or tobacco, or apply cosmetics in the regulated area, except that drinking water is permitted. Your employer is required to provide lunchrooms and other areas for these purposes.

Your employer is required to provide showers, washing facilities, and change rooms. If you work in a regulated area, you must wash your face, and hands before eating. You must shower at the end of the work shift. Do not take used protective clothing out of the change rooms without your employer's permission. Your employer is required to provide for laundering or cleaning of your protective clothing.

V. SIGNS AND LABELS

Your employer is required to post warning signs and labels for your protection. Signs must be posted in regulated areas. The signs must warn that a cancer hazard is present, that only authorized employees may enter the area, and that no smoking or eating is allowed. In regulated areas where coke oven emissions are above the permissible exposure limit, the signs should also warn that respirators must be worn.

VI. MEDICAL EXAMINATIONS

If you work in a regulated area at least 30 days per year, your employer is required to provide you with a medical examination every year. The medical examination must include a medical history, a chest x-ray, pulmonary function test, weight comparison, skin examination, a urinalysis, and a urine cytology exam for early detection of urinary cancer. The urine cytology exam is only included in the initial exam until you are either 45 years or older, or have 5 or more years employment in the regulated areas when the medical exams including this test, but excepting the x-ray exam, are to be given every six months; under these conditions, you are to be given an x-ray exam at least once a year. The examining physician will provide a written opinion to your employer containing the results of the medical exams. You should also receive a copy of this opinion.

VII. OBSERVATION OF MONITORING

Your employer is required to monitor your exposure to coke oven emissions and you are entitled to observe the monitoring procedure. You are entitled to receive an explanation of the measurement procedure, observe the steps taken in the measurement procedure, and to record the results obtained. When the monitoring procedure is taking place in an area where respirators or personal protective clothing and equipment are required to be worn, you must also be provided with and must wear the protective clothing and equipment.

VIII. ACCESS TO RECORDS

You or your representative are entitled to records of your exposure to coke oven emissions upon request to your employer. Your medical examination records can be furnished to your physician upon request to your employer.

IX. TRAINING AND EDUCATION

Additional information on all of these items plus training as to hazards of coke oven emissions and the engineering and work practice controls associated with your job will also be provided by your employer.

APPENDIX B — INDUSTRIAL HYGIENE AND MEDICAL SURVEILLANCE GUIDELINES

I. INDUSTRIAL HYGIENE GUIDELINES

A. Sampling (Benzene-Soluble Fraction Total Particulate Matter).

Samples collected should be full shift (at least 7-hour) samples. Sampling should be done using a personal sampling pump with pulsation damper at a flow rate of 2 liters per minute. Samples should be collected on 0.8 micrometer pore size silver membrane filters (37 mm diameter) preceded by Gelman glass fiber type A-E filters encased in three-piece plastic (polystyrene) field monitor cassettes. The cassette face cap should be on and the plug removed. The rotameter should be checked every hour to ensure that proper flow rates are maintained.

A minimum of three full-shift samples should be collected for each job classification on each battery, at least one from each shift. If disparate results are obtained for particular job classification, sampling should be repeated. It is advisable to sample each shift on more than one day to account for environmental variables (wind, precipitation, etc.) which may affect sampling. Differences in exposures among different work shifts may indicate a need to improve work practices on a particular shift. Sampling results from different shifts for each job classification should not be averaged. Multiple samples from same shift on each battery may be used to calculate an average exposure for a particular job classification.

B. Analysis.

1. All extraction glassware is cleaned with dichromic acid cleaning solution, rinsed with tap water, then de-ionized water, acetone, and allowed to dry completely. The glassware is rinsed with nanograde benzene before use. The Teflon cups are cleaned with benzene then with acetone.

2. Pre-weigh the 2 ml Teflon cups to one hundredth of a milligram (0.01 mg) on a autobalance AD 2 Tare weight of the cups is about 50 mg.

3. Place the silver membrane filter and glass fiber filter into a 15 ml test tube.

4. Extract with 5 ml of benzene for five minutes in an ultrasonic cleaner.

5. Filter the extract in 15 ml medium glass fritted funnels.

6. Rinse test tube and filters with two 1.5 ml aliquots of benzene and filter through the fritted glass funnel.

7. Collect the extract and two rinses in a 10 ml Kontes graduated evaporative concentrator.

8. Evaporate down to 1 ml while rinsing the sides with benzene.

9. Pipet 0.5 ml into the Teflon cup and evaporate to dryness in a vacuum oven at 40 deg. C for 3 hours.

10. Weigh the Teflon cup and the weight gain is due to the benzene soluble residue in half the Sample.

II. MEDICAL SURVEILLANCE GUIDELINES

A. General.

The minimum requirements for the medical examination for coke oven workers are given in paragraph (j) of the standard. The initial examination is to be provided to all coke oven workers who work at least 30 days in the regulated area. The examination includes a 14" x 17" posterior-anterior chest x-ray reading and a ILO/UC rating to assure some standardization of x-ray reading, pulmonary function tests (FVC and FEV 1.0), weight, urinalysis, skin examination, and a urinary cytologic examination. These tests are needed to serve as the baseline for comparing the employee's future test results. Periodic exams include all the elements of the initial exams, except that the urine cytologic test is to be performed only on those employees who are 45 years or older or who have worked for 5 or more years in the regulated area; periodic exams, with the exception of x-rays, are to be performed semiannually for this group instead of annually; for this group, x-rays will continue to be given at least annually. The examination contents are minimum requirements; additional tests such as lateral and oblique x-rays or additional pulmonary function tests may be performed if deemed necessary.

B. Pulmonary function tests.

Pulmonary function tests should be performed in a manner which minimizes subject and operator bias. There has been shown to be learning effects with regard to the results obtained from certain tests, such as FEV 1.0. Best results can be obtained by multiple trials for each subject. The best of three trials or the average of the last three of five trials may be used in obtaining reliable results. The type of equipment used (manufacturer, model, etc.) should be recorded with the results as reliability and accuracy varies and such information may be important in the evaluation of test results. Care should be exercised to obtain the best possible testing equipment.

C. Sputum cytology.

[Removed]

[41 FR 46784, Oct. 22, 1976, as amended at 42 FR 3304, Jan. 18, 1977; 45 FR 35283, May 23, 1980; 50 FR 37353, 37354, Sept. 13, 1985; 54 FR 24334, June 7, 1989; 61 FR 5507, Feb. 13, 1996; 63 FR 33450, June 18, 1998]



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