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**Occupational Safety and Health Administration**

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[Occupational Safety and Health Administration](#)

1910.1025 - Lead

- **Part Number:**

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- **Part Number Title:**

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Toxic and Hazardous Substances

- **Standard Number:**

[1910.1025](#)

- **Title:**

Lead.

- **Appendix:**

[A](#)

[B](#)

[C](#)

- **GPO Source:**

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1910.1025(a)

***Scope and application.***

1910.1025(a)(1)

This section applies to all occupational exposure to lead, except as provided in paragraph (a)(2).

1910.1025(a)(2)

This section does not apply to the construction industry or to agricultural operations covered by 29 CFR part 1928.

1910.1025(b)

***Definitions.*** *Action level* means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30  $\mu\text{g}/\text{m}^3$ ) averaged over an 8-hour period.

*Assistant Secretary* means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

*Director* means the Director, National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health, Education, and Welfare, or designee.

*Lead* means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

1910.1025(c)

***Permissible exposure limit (PEL).***

1910.1025(c)(1)

The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air ( $50 \mu\text{g}/\text{m}^3$ ) averaged over an 8-hour period.

1910.1025(c)(2)

If an employee is exposed to lead for more than 8 hours in any work day, the permissible exposure limit, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:

**Maximum permissible limit (in  $\mu\text{g}/\text{m}^3$ ) =  $400 \div$  hours worked in the day.**

1910.1025(c)(3)

When respirators are used to supplement engineering and work practice controls to comply with the PEL and all the requirements of paragraph (f) have been met, employee exposure, for the purpose of determining whether the employer has complied with the PEL, may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

[1910.1025\(d\)](#)

***Exposure monitoring -***

1910.1025(d)(1)

***General.***

1910.1025(d)(1)(i)

For the purposes of paragraph (d), employee exposure is that exposure which would occur if the employee were not using a respirator.

1910.1025(d)(1)(ii)

With the exception of monitoring under paragraph (d)(3), the employer shall collect full shift (for at least 7 continuous hours) personal samples including at least one sample for each shift for each job classification in each work area.

1910.1025(d)(1)(iii)

Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

1910.1025(d)(2)

**Initial determination.** Each employer who has a workplace or work operation covered by this standard shall determine if any employee may be exposed to lead at or above the action level.

1910.1025(d)(3)

**Basis of initial determination.**

1910.1025(d)(3)(i)

The employer shall monitor employee exposures and shall base initial determinations on the employee exposure monitoring results and any of the following, relevant considerations:

1910.1025(d)(3)(i)(A)

Any information, observations, or calculations which would indicate employee exposure to lead;

1910.1025(d)(3)(i)(B)

Any previous measurements of airborne lead; and

1910.1025(d)(3)(i)(C)

Any employee complaints of symptoms which may be attributable to exposure to lead.

1910.1025(d)(3)(ii)

Monitoring for the initial determination may be limited to a representative sample of the exposed employees who the employer reasonably believes are exposed to the greatest airborne concentrations of lead in the workplace.

1910.1025(d)(3)(iii)

Measurements of airborne lead made in the preceding 12 months may be used to satisfy the requirement to monitor under paragraph (d)(3)(i) if the sampling and analytical methods used meet the accuracy and confidence levels of paragraph (d)(9) of this section.

1910.1025(d)(4)

**Positive initial determination and initial monitoring.**

1910.1025(d)(4)(i)

Where a determination conducted under paragraphs (d) (2) and (3) of this section shows the possibility of any employee exposure at or above the action level, the employer shall conduct monitoring which is representative of the exposure for each employee in the workplace who is exposed to lead.

1910.1025(d)(4)(ii)

Measurements of airborne lead made in the preceding 12 months may be used to satisfy this requirement if the sampling and analytical methods used meet the accuracy and confidence levels of paragraph (d)(9) of this section.

[1910.1025\(d\)\(5\)](#)

**Negative initial determination.** Where a determination, conducted under paragraphs (d) (2) and (3) of this section is made that no employee is exposed to airborne concentrations of lead at or above the action level, the employer shall make a written record of such determination. The record shall include at least the information specified in paragraph (d)(3) of this section and shall also include the date of determination, location within the worksite, and the name number of each employee monitored.

1910.1025(d)(6)

**Frequency.**

1910.1025(d)(6)(i)

If the initial monitoring reveals employee exposure to be below the action level the measurements need not be repeated except as otherwise provided in paragraph (d)(7) of this section.

1910.1025(d)(6)(ii)

If the initial determination or subsequent monitoring reveals employee exposure to be at or above the action level but below the permissible exposure limit the employer shall repeat monitoring in accordance with this paragraph at least every 6 months. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time the employer may discontinue monitoring for that employee except as otherwise provided in paragraph (d)(7) of this section.

1910.1025(d)(6)(iii)

If the initial monitoring reveals that employee exposure is above the permissible exposure limit the employer shall repeat monitoring quarterly. The employer shall continue

monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the PEL but at or above the action level at which time the employer shall repeat monitoring for that employee at the frequency specified in paragraph (d)(6)(ii), except as otherwise provided in paragraph (d)(7) of this section.

1910.1025(d)(7)

**Additional monitoring.** Whenever there has been a production, process, control or personnel change which may result in new or additional exposure to lead, or whenever the employer has any other reason to suspect a change which may result in new or additional exposures to lead, additional monitoring in accordance with this paragraph shall be conducted.

[1910.1025\(d\)\(8\)](#)

**Employee notification.**

1910.1025(d)(8)(i)

The employer must, within 15 working days after the receipt of the results of any monitoring performed under this section, notify each affected employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to affected employees.

1910.1025(d)(8)(ii)

Whenever the results indicate that the representative employee exposure, without regard to respirators, exceeds the permissible exposure limit, the employer shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action taken or to be taken to reduce exposure to or below the permissible exposure limit.

1910.1025(d)(9)

**Accuracy of measurement.** The employer shall use a method of monitoring and analysis which has an accuracy (to a confidence level of 95%) of not less than plus or minus 20 percent for airborne concentrations of lead equal to or greater than 30  $\mu\text{g}/\text{m}^3$ .

[1910.1025\(e\)](#)

**Methods of compliance -**

[1910.1025\(e\)\(1\)](#)

**Engineering and work practice controls.**

1910.1025(e)(1)(i)

Where any employee is exposed to lead above the permissible exposure limit for more than 30 days per year, the employer shall implement engineering and work practice controls (including administrative controls) to reduce and maintain employee exposure to lead in accordance with the implementation schedule in Table I below, except to the extent that the employer can demonstrate that such controls are not feasible. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest feasible level and shall supplement them by the use of respiratory protection which complies with the requirements of paragraph (f) of this section.

1910.1025(e)(1)(ii)

Where any employee is exposed to lead above the permissible exposure limit, but for 30 days or less per year, the employer shall implement engineering controls to reduce exposures to 200  $\mu\text{g}/\text{m}^3$ , but thereafter may implement any combination of engineering, work practice (including administrative controls), and respiratory controls to reduce and maintain employee exposure to lead to or below 50  $\mu\text{g}/\text{m}^3$ .

Table I

**Industry**

Lead chemicals, secondary copper smelting.

Nonferrous foundries.

Brass and bronze ingot manufacture.

<sup>1</sup> Calculated by counting from the date the stay on implementation of paragraph (e)(1) was lifted by the U.S. Court of Appeals for the District of Columbia, the number of years specified in the 1978 lead standard and subsequent amendments for compliance with the PEL of 50  $\mu\text{g}/\text{m}^3$  for exposure to airborne concentrations of lead levels for the particular industry.

<sup>2</sup> Large nonferrous foundries (20 or more employees) are required to achieve the PEL of 50  $\mu\text{g}/\text{m}^3$  by means of engineering and work practice controls. Small nonferrous foundries

(fewer than 20 employees) are required to achieve an 8-hour TWA of 75 µg/m<sup>3</sup> by such controls.

<sup>3</sup> Expressed as the number of years from the date on which the Court lifts the stay on the implementation of paragraph (e)(1) for this industry for employers to achieve a lead in air concentration of 75 µg/m<sup>3</sup>. Compliance with paragraph (e) in this industry is determined by a compliance directive that incorporates elements from the settlement agreement between OSHA and representatives of the industry.

1910.1025(e)(2)

**Respiratory protection.** Where engineering and work practice controls do not reduce employee exposure to or below the 50 µg/m<sup>3</sup> permissible exposure limit, the employer shall supplement these controls with respirators in accordance with paragraph (f).

1910.1025(e)(3)

**Compliance program.**

1910.1025(e)(3)(i)

Each employer shall establish and implement a written compliance program to reduce exposures to or below the permissible exposure limit, and interim levels if applicable, solely by means of engineering and work practice controls in accordance with the implementation schedule in paragraph (e)(1).

1910.1025(e)(3)(ii)

Written plans for these compliance programs shall include at least the following:

1910.1025(e)(3)(ii)(A)

A description of each operation in which lead is emitted; e.g. machinery used, material processed, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices;

1910.1025(e)(3)(ii)(B)

A description of the specific means that will be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure to lead;

1910.1025(e)(3)(ii)(C)

A report of the technology considered in meeting the permissible exposure limit;



1910.1025(e)(3)(ii)(D)

Air monitoring data which documents the source of lead emissions;

1910.1025(e)(3)(ii)(E)

A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.;

1910.1025(e)(3)(ii)(F)

A work practice program which includes items required under paragraphs (g), (h) and (i) of this regulation;

1910.1025(e)(3)(ii)(G)

An administrative control schedule required by paragraph (e)(5) of this section, if applicable;

1910.1025(e)(3)(ii)(H)

Other relevant information.

1910.1025(e)(3)(iii)

Written programs shall be submitted upon request to the Assistant Secretary and the Director, and shall be available at the worksite for examination and copying by the Assistant Secretary, Director, any affected employee or authorized employee representatives.

1910.1025(e)(3)(iv)

Written programs must be revised and updated at least annually to reflect the current status of the program.

1910.1025(e)(4)

***Mechanical ventilation.***

1910.1025(e)(4)(i)

When ventilation is used to control exposure, measurements which demonstrate the effectiveness of the system in controlling exposure, such as capture velocity, duct velocity, or static pressure shall be made at least every 3 months. Measurements of the system's effectiveness in controlling exposure shall be made within 5 days of any change in production, process, or control which might result in a change in employee exposure to lead.

[1910.1025\(e\)\(4\)\(ii\)](#)

**Recirculation of air.** If air from exhaust ventilation is recirculated into the workplace, the employer shall assure that

1910.1025(e)(4)(ii)(A)

the system has a high efficiency filter with reliable back-up filter; and

1910.1025(e)(4)(ii)(B)

controls to monitor the concentration of lead in the return air and to bypass the recirculation system automatically if it fails are installed, operating, and maintained.

1910.1025(e)(5)

**Administrative controls.** If administrative controls are used as a means of reducing employees TWA exposure to lead, the employer shall establish and implement a job rotation schedule which includes:

1910.1025(e)(5)(i)

Name or identification number of each affected employee;

1910.1025(e)(5)(ii)

Duration and exposure levels at each job or work station where each affected employee is located; and

1910.1025(e)(5)(iii)

Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead.

1910.1025(f)

**Respiratory protection -**

[1910.1025\(f\)\(1\)](#)

**General.** For employees who use respirators required by this section, the employer must provide each employee an appropriate respirator that complies with the requirements of this paragraph. Respirators must be used during:

1910.1025(f)(1)(i)

Periods necessary to install or implement engineering or work-practice controls.

1910.1025(f)(1)(ii)

Work operations for which engineering and work-practice controls are not sufficient to reduce employee exposures to or below the permissible exposure limit.

1910.1025(f)(1)(iii)

Periods when an employee requests a respirator.

[1910.1025\(f\)\(2\)](#)

***Respirator program.***

1910.1025(f)(2)(i)

The employer must implement a respiratory protection program in accordance with § 1910.134(b) through (d) (except (d)(1)(iii)), and (f) through (m), which covers each employee required by this section to use a respirator.

[1910.1025\(f\)\(2\)\(ii\)](#)

If an employee has breathing difficulty during fit testing or respirator use, the employer must provide the employee with a medical examination in accordance with paragraph (j)(3)(i)(C) of this section to determine whether or not the employee can use a respirator while performing the required duty.

1910.1025(f)(3)

***Respirator selection.***

1910.1025(f)(3)(i)

Employers must:

1910.1025(f)(3)(i)(A)

Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of 29 CFR 1910.134.

1910.1025(f)(3)(i)(B)

Provide employees with full facepiece respirators instead of half mask respirators for protection against lead aerosols that cause eye or skin irritation at the use concentrations.

1910.1025(f)(3)(i)(C)

Provide HEPA filters for powered and non-powered air-purifying respirators.

1910.1025(f)(3)(ii)

Employers must provide employees with a powered air-purifying respirator (PAPR) instead of a negative pressure respirator selected according to paragraph (f)(3)(i) of this standard when an employee chooses to use a PAPR and it provides adequate protection to the employee as specified by paragraph (f)(3)(i) of this standard.

1910.1025(g)

***Protective work clothing and equipment -***

1910.1025(g)(1)

***Provision and use.*** If an employee is exposed to lead above the PEL, without regard to the use of respirators or where the possibility of skin or eye irritation exists, the employer shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

1910.1025(g)(1)(i)

Coveralls or similar full-body work clothing;

1910.1025(g)(1)(ii)

Gloves, hats, and shoes or disposable shoe coverlets; and

1910.1025(g)(1)(iii)

Face shields, vented goggles, or other appropriate protective equipment which complies with § 1910.133 of this Part.

1910.1025(g)(2)

***Cleaning and replacement.***

1910.1025(g)(2)(i)

The employer shall provide the protective clothing required in paragraph (g)(1) of this section in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 µg/m<sup>3</sup> of lead as an 8-hour TWA.

1910.1025(g)(2)(ii)

The employer shall provide for the cleaning, laundering, or disposal of protective clothing and equipment required by paragraph (g)(1) of this section.

1910.1025(g)(2)(iii)

The employer shall repair or replace required protective clothing and equipment as needed to maintain their effectiveness.

1910.1025(g)(2)(iv)

The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms provided for that purpose as prescribed in paragraph (i)(2) of this section.

1910.1025(g)(2)(v)

The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change-room which prevents dispersion of lead outside the container.

1910.1025(g)(2)(vi)

The employer shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

1910.1025(g)(2)(vii)

Labeling of contaminated protective clothing and equipment.

1910.1025(g)(2)(vii)(A)

The employer shall ensure that labels of bags or containers of contaminated protective clothing and equipment include the following information:

**DANGER: CLOTHING AND EQUIPMENT CONTAMINATED WITH LEAD. MAY DAMAGE FERTILITY OR THE UNBORN CHILD. CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM. DO NOT EAT, DRINK OR SMOKE WHEN HANDLING. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.**

1910.1025(g)(2)(vii)(B)

Prior to June 1, 2015, employers may include the following information on bags or containers of contaminated protective clothing and equipment in lieu of the labeling requirements in paragraphs (g)(2)(vii)(A) of this section:

**CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS.**

1910.1025(g)(2)(viii)

The employer shall prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.

[1910.1025\(h\)](#)

***Housekeeping -***

1910.1025(h)(1)

***Surfaces.*** All surfaces shall be maintained as free as practicable of accumulations of lead.

[1910.1025\(h\)\(2\)](#)

***Cleaning floors.***

1910.1025(h)(2)(i)

Floors and other surfaces where lead accumulates may not be cleaned by the use of compressed air.

[1910.1025\(h\)\(2\)\(ii\)](#)

Shoveling, dry or wet sweeping, and brushing may be used only where vacuuming or other equally effective methods have been tried and found not to be effective.

1910.1025(h)(3)

***Vacuuming.*** Where vacuuming methods are selected, the vacuums shall be used and emptied in a manner which minimizes the reentry of lead into the workplace.

1910.1025(i)

***Hygiene facilities and practices.***

1910.1025(i)(1)

The employer shall assure that in areas where employees are exposed to lead above the PEL, without regard to the use of respirators, food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in change rooms, lunchrooms, and showers required under paragraphs (i)(2) through (i)(4) of this section.

1910.1025(i)(2)

***Change rooms.***

1910.1025(i)(2)(i)

The employer shall provide clean change rooms for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.

1910.1025(i)(2)(ii)

The employer shall assure that change rooms are equipped with separate storage facilities for protective work clothing and equipment and for street clothes which prevent cross-contamination.

1910.1025(i)(3)

**Showers.**

[1910.1025\(i\)\(3\)\(i\)](#)

The employer shall assure that employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators, shower at the end of the work shift.

1910.1025(i)(3)(ii)

The employer shall provide shower facilities in accordance with § 1910.141 (d)(3) of this part.

1910.1025(i)(3)(iii)

The employer shall assure that employees who are required to shower pursuant to paragraph (i)(3)(i) do not leave the workplace wearing any clothing or equipment worn during the work shift.

1910.1025(i)(4)

**Lunchrooms.**

1910.1025(i)(4)(i)

The employer shall provide lunchroom facilities for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.

1910.1025(i)(4)(ii)

The employer shall assure that lunchroom facilities have a temperature controlled, positive pressure, filtered air supply, and are readily accessible to employees.

1910.1025(i)(4)(iii)

The employer shall assure that employees who work in areas where their airborne exposure to lead is above the PEL without regard to the use of a respirator wash their hands and face prior to eating, drinking, smoking or applying cosmetics.

[1910.1025\(i\)\(4\)\(iv\)](#)

The employer shall assure that employees do not enter lunchroom facilities with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, downdraft booth, or other cleaning method.

1910.1025(i)(5)

**Lavatories.** The employer shall provide an adequate number of lavatory facilities which comply with § 1910.141(d) (1) and (2) of this part.

[1910.1025\(j\)](#)

**Medical surveillance -**

1910.1025(j)(1)

**General.**

[1910.1025\(j\)\(1\)\(i\)](#)

The employer shall institute a medical surveillance program for all employees who are or may be exposed at or above the action level for more than 30 days per year.

1910.1025(j)(1)(ii)

The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician.

1910.1025(j)(1)(iii)

The employer shall provide the required medical surveillance including multiple physician review under paragraph (j)(3)(iii) without cost to employees and at a reasonable time and place.

[1910.1025\(j\)\(2\)](#)

**Biological monitoring -**

[1910.1025\(j\)\(2\)\(i\)](#)

**Blood lead and ZPP level sampling and analysis.** The employer shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc



protoporphyrin levels to each employee covered under paragraph (j)(1)(i) of this section on the following schedule:

1910.1025(j)(2)(i)(A)

At least every 6 months to each employee covered under paragraph (j)(1)(i) of this section;

1910.1025(j)(2)(i)(B)

At least every two months for each employee whose last blood sampling and analysis indicated a blood lead level at or above 40 µg/100 g of whole blood. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 µg/100 g of whole blood; and

1910.1025(j)(2)(i)(C)

At least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.

[1910.1025\(j\)\(2\)\(ii\)](#)

**Follow-up blood sampling tests.** Whenever the results of a blood lead level test indicate that an employee's blood lead level is at or above the numerical criterion for medical removal under paragraph (k)(1)(i)(A) of this section, the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.

[1910.1025\(j\)\(2\)\(iii\)](#)

**Accuracy of blood lead level sampling and analysis.** Blood lead level sampling and analysis provided pursuant to this section shall have an accuracy (to a confidence level of 95 percent) within plus or minus 15 percent or 6 µg/100ml, whichever is greater, and shall be conducted by a laboratory licensed by the Center for Disease Control, United States Department of Health, Education and Welfare (CDC) or which has received a satisfactory grade in blood lead proficiency testing from CDC in the prior twelve months.

1910.1025(j)(2)(iv)

**Employee notification.** Within five working days after the receipt of biological monitoring results, the employer shall notify in writing each employee whose blood lead level is at or above 40 µg/100 g:

1910.1025(j)(2)(iv)(A)

Of that employee's blood lead level; and

1910.1025(j)(2)(iv)(B)

That the standard requires temporary medical removal with Medical Removal Protection benefits when an employee's blood lead level is at or above the numerical criterion for medical removal under paragraph (k)(1)(i) of this section.

1910.1025(j)(3)

***Medical examinations and consultations -***

1910.1025(j)(3)(i)

***Frequency.*** The employer shall make available medical examinations and consultations to each employee covered under paragraph (j)(1)(i) of this section on the following schedule:

1910.1025(j)(3)(i)(A)

At least annually for each employee for whom a blood sampling test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40 µg/100 g;

1910.1025(j)(3)(i)(B)

Prior to assignment for each employee being assigned for the first time to an area in which airborne concentrations of lead are at or above the action level;

1910.1025(j)(3)(i)(C)

As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use; and

1910.1025(j)(3)(i)(D)

As medically appropriate for each employee either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination.

1910.1025(j)(3)(ii)

***Content.*** Medical examinations made available pursuant to paragraph (j)(3)(i) (A) through (B) of this section shall include the following elements:

1910.1025(j)(3)(ii)(A)

A detailed work history and a medical history, with particular attention to past lead exposure (occupational and non-occupational), personal habits (smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive and neurological problems;

1910.1025(j)(3)(ii)(B)

A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be evaluated if respiratory protection will be used;

1910.1025(j)(3)(ii)(C)

A blood pressure measurement;

1910.1025(j)(3)(ii)(D)

A blood sample and analysis which determines:

1910.1025(j)(3)(ii)(D)(1)

Blood lead level;

1910.1025(j)(3)(ii)(D)(2)

Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology;

1910.1025(j)(3)(ii)(D)(3)

Zinc protoporphyrin;

1910.1025(j)(3)(ii)(D)(4)

Blood urea nitrogen; and,

1910.1025(j)(3)(ii)(D)(5)

Serum creatinine;

1910.1025(j)(3)(ii)(E)

A routine urinalysis with microscopic examination; and

1910.1025(j)(3)(ii)(F)

Any laboratory or other test which the examining physician deems necessary by sound medical practice.

The content of medical examinations made available pursuant to paragraph (j)(3)(i) (C) through (D) of this section shall be determined by an examining physician and, if requested by an employee, shall include pregnancy testing or laboratory evaluation of male fertility.

[1910.1025\(j\)\(3\)\(iii\)](#)

***Multiple physician review mechanism.***

1910.1025(j)(3)(iii)(A)

If the employer selects the initial physician who conducts any medical examination or consultation provided to an employee under this section, the employee may designate a second physician:

1910.1025(j)(3)(iii)(A)(1)

To review any findings, determinations or recommendations of the initial physician; and

1910.1025(j)(3)(iii)(A)(2)

To conduct such examinations, consultations, and laboratory tests as the second physician deems necessary to facilitate this review.

1910.1025(j)(3)(iii)(B)

The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen (15) days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

1910.1025(j)(3)(iii)(B)(1)

The employee informing the employer that he or she intends to seek a second medical opinion, and

1910.1025(j)(3)(iii)(B)(2)

The employee initiating steps to make an appointment with a second physician.

1910.1025(j)(3)(iii)(C)

If the findings, determinations or recommendations of the second physician differ from those of the initial physician, then the employer and the employee shall assure that efforts are made for the two physicians to resolve any disagreement.

1910.1025(j)(3)(iii)(D)

If the two physicians have been unable to quickly resolve their disagreement, then the employer and the employee through their respective physicians shall designate a third physician:

1910.1025(j)(3)(iii)(D)(1)

To review any findings, determinations or recommendations of the prior physicians; and

1910.1025(j)(3)(iii)(D)(2)

To conduct such examinations, consultations, laboratory tests and discussions with the prior physicians as the third physician deems necessary to resolve the disagreement of the prior physicians.

1910.1025(j)(3)(iii)(E)

The employer shall act consistent with the findings, determinations and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

1910.1025(j)(3)(iv)

***Information provided to examining and consulting physicians.***

1910.1025(j)(3)(iv)(A)

The employer shall provide an initial physician conducting a medical examination or consultation under this section with the following information:

1910.1025(j)(3)(iv)(A)(1)

A copy of this regulation for lead including all Appendices;

1910.1025(j)(3)(iv)(A)(2)

A description of the affected employee's duties as they relate to the employee's exposure;

1910.1025(j)(3)(iv)(A)(3)

The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);

1910.1025(j)(3)(iv)(A)(4)

A description of any personal protective equipment used or to be used;

1910.1025(j)(3)(iv)(A)(5)

Prior blood lead determinations; and

1910.1025(j)(3)(iv)(A)(6)

All prior written medical opinions concerning the employee in the employer's possession or control.

1910.1025(j)(3)(iv)(B)

The employer shall provide the foregoing information to a second or third physician conducting a medical examination or consultation under this section upon request either by the second or third physician, or by the employee.

1910.1025(j)(3)(v)

***Written medical opinions.***

1910.1025(j)(3)(v)(A)

The employer shall obtain and furnish the employee with a copy of a written medical opinion from each examining or consulting physician which contains the following information:

1910.1025(j)(3)(v)(A)(1)

The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead;

1910.1025(j)(3)(v)(A)(2)

Any recommended special protective measures to be provided to the employee, or limitations to be placed upon the employee's exposure to lead;

1910.1025(j)(3)(v)(A)(3)

Any recommended limitation upon the employee's use of respirators, including a determination of whether the employee can wear a powered air purifying respirator if a physician determines that the employee cannot wear a negative pressure respirator; and

1910.1025(j)(3)(v)(A)(4)

The results of the blood lead determinations.

1910.1025(j)(3)(v)(B)

The employer shall instruct each examining and consulting physician to:

[1910.1025\(j\)\(3\)\(v\)\(B\)\(1\)](#)

Not reveal either in the written opinion, or in any other means of communication with the employer, findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead; and

1910.1025(j)(3)(v)(B)(2)

Advise the employee of any medical condition, occupational or nonoccupational, which dictates further medical examination or treatment.

1910.1025(j)(3)(vi)

***Alternate Physician Determination Mechanisms.*** The employer and an employee or authorized employee representative may agree upon the use of any expeditious alternate physician determination mechanism in lieu of the multiple physician review mechanism provided by this paragraph so long as the alternate mechanism otherwise satisfies the requirements contained in this paragraph.

[1910.1025\(j\)\(4\)](#)

***Chelation.***

1910.1025(j)(4)(i)

The employer shall assure that any person whom he retains, employs, supervises or controls does not engage in prophylactic chelation of any employee at any time.

1910.1025(j)(4)(ii)

If therapeutic or diagnostic chelation is to be performed by any person in paragraph (j)(4)(i), the employer shall assure that it be done under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring and that the employee is notified in writing prior to its occurrence.

[1910.1025\(k\)](#)

***Medical Removal Protection -***

1910.1025(k)(1)

***Temporary medical removal and return of an employee -***

[1910.1025\(k\)\(1\)\(i\)](#)

***Temporary removal due to elevated blood lead levels.***

1910.1025(k)(1)(i)(A)

The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 60 µg/100 g of whole blood; and

1910.1025(k)(1)(i)(B)

The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that the average of the last three blood sampling tests conducted pursuant to this section (or the average of all blood sampling tests conducted over the previous six (6) months, whichever is longer) indicates that the employee's blood lead level is at or above 50 µg/100 g of whole blood; provided, however, that an employee need not be removed if the last blood sampling test indicates a blood lead level below 40 µg/100 g of whole blood.

[1910.1025\(k\)\(1\)\(ii\)](#)

***Temporary removal due to a final medical determination.***

1910.1025(k)(1)(ii)(A)

The employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a final medical determination results in a medical finding, determination, or opinion that the employee has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

1910.1025(k)(1)(ii)(B)

For the purposes of this section, the phrase "final medical determination" shall mean the outcome of the multiple physician review mechanism or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section.

1910.1025(k)(1)(ii)(C)

Where a final medical determination results in any recommended special protective measures for an employee, or limitations on an employee's exposure to lead, the employer shall implement and act consistent with the recommendation.

1910.1025(k)(1)(iii)



***Return of the employee to former job status.***

1910.1025(k)(1)(iii)(A)

The employer shall return an employee to his or her former job status:

[1910.1025\(k\)\(1\)\(iii\)\(A\)\(1\)](#)

For an employee removed due to a blood lead level at or above 60 µg/100 g, or due to an average blood lead level at or above 50 µg/100 g, when two consecutive blood sampling tests indicate that the employee's blood lead level is below 40 µg/100 g of whole blood;

1910.1025(k)(1)(iii)(A)(2)

For an employee removed due to a final medical determination, when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

1910.1025(k)(1)(iii)(B)

For the purposes of this section, the requirement that an employer return an employee to his or her former job status is not intended to expand upon or restrict any rights an employee has or would have had, absent temporary medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

1910.1025(k)(1)(iv)

***Removal of other employee special protective measure or limitations.*** The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

1910.1025(k)(1)(v)

***Employer options pending a final medical determination.*** Where the multiple physician review mechanism, or alternate medical determination mechanism used pursuant to the medical surveillance provisions of this section, has not yet resulted in a final medical determination with respect to an employee, the employer shall act as follows:

1910.1025(k)(1)(v)(A)

***Removal.*** The employer may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent

with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

1910.1025(k)(1)(v)(B)

**Return.** The employer may return the employee to his or her former job status, end any special protective measures provided to the employee, and remove any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status, with two exceptions. If

1910.1025(k)(1)(v)(B)(1)

the initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings, determinations, or recommendations of the initial physician or

1910.1025(k)(1)(v)(B)(2)

The employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the employer shall await a final medical determination.

[1910.1025\(k\)\(2\)](#)

***Medical removal protection benefits -***

1910.1025(k)(2)(i)

***Provision of medical removal protection benefits.*** The employer shall provide to an employee up to eighteen (18) months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to this section.

1910.1025(k)(2)(ii)

***Definition of medical removal protection benefits.*** For the purposes of this section, the requirement that an employer provide medical removal protection benefits means that the employer shall maintain the earnings, seniority and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to lead or otherwise limited.

1910.1025(k)(2)(iii)

***Follow-up medical surveillance during the period of employee removal or limitation.***

During the period of time that an employee is removed from normal exposure to lead or

otherwise limited, the employer may condition the provision of medical removal protection benefits upon the employee's participation in follow-up medical surveillance made available pursuant to this section.

1910.1025(k)(2)(iv)

**Workers' compensation claims.** If a removed employee files a claim for workers' compensation payments for a lead-related disability, then the employer shall continue to provide medical removal protection benefits pending disposition of the claim. To the extent that an award is made to the employee for earnings lost during the period of removal, the employer's medical removal protection obligation shall be reduced by such amount. The employer shall receive no credit for workers' compensation payments received by the employee for treatment related expenses.

1910.1025(k)(2)(v)

**Other credits.** The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with another employer made possible by virtue of the employee's removal.

1910.1025(k)(2)(vi)

**Employees whose blood lead levels do not adequately decline within 18 months of removal.** The employer shall take the following measures with respect to any employee removed from exposure to lead due to an elevated blood lead level whose blood lead level has not declined within the past eighteen (18) months of removal so that the employee has been returned to his or her former job status:

1910.1025(k)(2)(vi)(A)

The employer shall make available to the employee a medical examination pursuant to this section to obtain a final medical determination with respect to the employee;

1910.1025(k)(2)(vi)(B)

The employer shall assure that the final medical determination obtained indicates whether or not the employee may be returned to his or her former job status, and if not, what steps should be taken to protect the employee's health;

1910.1025(k)(2)(vi)(C)

Where the final medical determination has not yet been obtained, or once obtained indicates that the employee may not yet be returned to his or her former job status, the employer shall continue to provide medical removal protection benefits to the employee until either the employee is returned to former job status, or a final medical determination is made that the employee is incapable of ever safely returning to his or her former job status.

1910.1025(k)(2)(vi)(D)

Where the employer acts pursuant to a final medical determination which permits the return of the employee to his or her former job status despite what would otherwise be an unacceptable blood lead level, later questions concerning removing the employee again shall be decided by a final medical determination. The employer need not automatically remove such an employee pursuant to the blood lead level removal criteria provided by this section.

1910.1025(k)(2)(vii)

***Voluntary Removal or Restriction of An Employee.*** Where an employer, although not required by this section to do so, removes an employee from exposure to lead or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition, the employer shall provide medical removal protection benefits to the employee equal to that required by paragraph (k)(2)(i) of this section.

1910.1025(l)

***Employee information and training -***

1910.1025(l)(1)

***Training program.***

[1910.1025\(l\)\(1\)\(i\)](#)

Each employer who has a workplace in which there is a potential exposure to airborne lead at any level shall inform employees of the content of Appendices A and B of this regulation.

[1910.1025\(l\)\(1\)\(ii\)](#)

The employer shall train each employee who is subject to exposure to lead at or above the action level, or for whom the possibility of skin or eye irritation exists, in accordance with the requirements of this section. The employer shall institute a training program and ensure employee participation in the program.

[1910.1025\(l\)\(1\)\(iii\)](#)

The employer shall provide initial training by 180 days from the effective date for those employees covered by paragraph (l)(1) (ii) on the standard's effective date and prior to the time of initial job assignment for those employees subsequently covered by this paragraph.

1910.1025(l)(1)(iv)

The training program shall be repeated at least annually for each employee.

1910.1025(l)(1)(v)

The employer shall assure that each employee is informed of the following:

1910.1025(l)(1)(v)(A)

The content of this standard and its appendices;

1910.1025(l)(1)(v)(B)

The specific nature of the operations which could result in exposure to lead above the action level;

1910.1025(l)(1)(v)(C)

The purpose, proper selection, fitting, use, and limitations of respirators;

1910.1025(l)(1)(v)(D)

The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females);

1910.1025(l)(1)(v)(E)

The engineering controls and work practices associated with the employee's job assignment;

1910.1025(l)(1)(v)(F)

The contents of any compliance plan in effect; and

1910.1025(l)(1)(v)(G)

Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician;

1910.1025(l)(2)

***Access to information and training materials.***

1910.1025(l)(2)(i)

The employer shall make readily available to all affected employees a copy of this standard and its appendices.

1910.1025(l)(2)(ii)

The employer shall provide, upon request, all materials relating to the employee information and training program to the Assistant Secretary and the Director.

1910.1025(l)(2)(iii)

In addition to the information required by paragraph (l)(1)(v), the employer shall include as part of the training program, and shall distribute to employees, any materials pertaining to the Occupational Safety and Health Act, the regulations issued pursuant to that Act, and this lead standard, which are made available to the employer by the Assistant Secretary.

1910.1025(m)

***Communication of hazards -***

1910.1025(m)(1)

***Hazard communication - general.***

1910.1025(m)(1)(i)

Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the Hazard Communication Standard (HCS) (§ 1910.1200) for lead.

1910.1025(m)(1)(ii)

In classifying the hazards of lead at least the following hazards are to be addressed: Reproductive/developmental toxicity; central nervous system effects; kidney effects; blood effects; and acute toxicity effects.

1910.1025(m)(1)(iii)

Employers shall include lead in the hazard communication program established to comply with the HCS (§ 1910.1200). Employers shall ensure that each employee has access to labels on containers of lead and to safety data sheets, and is trained in accordance with the requirements of HCS and paragraph (l) of this section.

1910.1025(m)(2)

**Signs.**

1910.1025(m)(2)(i)

The employer shall post the following warning signs in each work area where the PEL is exceeded:

DANGER

LEAD

MAY DAMAGE FERTILITY OR THE UNBORN CHILD

CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM

DO NOT EAT, DRINK OR SMOKE IN THIS AREA

1910.1025(m)(2)(ii)

The employer shall ensure that no statement appears on or near any sign required by this paragraph (m)(2) which contradicts or detracts from the meaning of the required sign.

1910.1025(m)(2)(iii)

The employer shall ensure that signs required by this paragraph (m)(2) are illuminated and cleaned as necessary so that the legend is readily visible.

1910.1025(m)(2)(iv)

The employer may use signs required by other statutes, regulations, or ordinances in addition to, or in combination with, signs required by this paragraph (m)(2).

1910.1025(m)(2)(v)

Prior to June 1, 2016, employers may use the following legend in lieu of that specified in paragraph (m)(2)(ii) of this section:

WARNING

LEAD WORK AREA

POISON

NO SMOKING OR EATING

1910.1025(n)

**Recordkeeping -**

1910.1025(n)(1)

**Exposure monitoring.**

[1910.1025\(n\)\(1\)\(i\)](#)

The employer shall establish and maintain an accurate record of all monitoring required in paragraph (d) of this section.

1910.1025(n)(1)(ii)

This record shall include:

1910.1025(n)(1)(ii)(A)

The date(s), number, duration, location and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;

1910.1025(n)(1)(ii)(B)

A description of the sampling and analytical methods used and evidence of their accuracy;

1910.1025(n)(1)(ii)(C)

The type of respiratory protective devices worn, if any;

[1910.1025\(n\)\(1\)\(ii\)\(D\)](#)

Name and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and

1910.1025(n)(1)(ii)(E)

The environmental variables that could affect the measurement of employee exposure.

1910.1025(n)(1)(iii)

The employer shall maintain these monitoring records for at least 40 years or for the duration of employment plus 20 years, whichever is longer.

1910.1025(n)(2)

***Medical surveillance.***

1910.1025(n)(2)(i)

The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by paragraph (j) of this section.

1910.1025(n)(2)(ii)

This record shall include:



1910.1025(n)(2)(ii)(A)

The name and description of the duties of the employee;

1910.1025(n)(2)(ii)(B)

A copy of the physician's written opinions;

1910.1025(n)(2)(ii)(C)

Results of any airborne exposure monitoring done for that employee and the representative exposure levels supplied to the physician; and

1910.1025(n)(2)(ii)(D)

Any employee medical complaints related to exposure to lead.

1910.1025(n)(2)(iii)

The employer shall keep, or assure that the examining physician keeps, the following medical records:

1910.1025(n)(2)(iii)(A)

A copy of the medical examination results including medical and work history required under paragraph (j) of this section;

1910.1025(n)(2)(iii)(B)

A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information;

1910.1025(n)(2)(iii)(C)

A copy of the results of biological monitoring.

1910.1025(n)(2)(iv)

The employer shall maintain or assure that the physician maintains those medical records for at least 40 years, or for the duration of employment plus 20 years, whichever is longer.

1910.1025(n)(3)

***Medical removals.***

1910.1025(n)(3)(i)

The employer shall establish and maintain an accurate record for each employee removed from current exposure to lead pursuant to paragraph (k) of this section.

1910.1025(n)(3)(ii)

Each record shall include:

1910.1025(n)(3)(ii)(A)

The name of the employee;

1910.1025(n)(3)(ii)(B)

The date on each occasion that the employee was removed from current exposure to lead as well as the corresponding date on which the employee was returned to his or her former job status;

1910.1025(n)(3)(ii)(C)

A brief explanation of how each removal was or is being accomplished; and

1910.1025(n)(3)(ii)(D)

A statement with respect to each removal indicating whether or not the reason for the removal was an elevated blood lead level.

1910.1025(n)(3)(iii)

The employer shall maintain each medical removal record for at least the duration of an employee's employment.

1910.1025(n)(4)

***Availability.***

1910.1025(n)(4)(i)

The employer shall make available upon request all records required to be maintained by paragraph (n) of this section to the Assistant Secretary and the Director for examination and copying.

1910.1025(n)(4)(ii)

Environmental monitoring, medical removal, and medical records required by this paragraph shall be provided upon request to employees, designated representatives, and the Assistant Secretary in accordance with 29 CFR 1910.1020 (a)-(e) and (2) - (i). Medical removal records shall be provided in the same manner as environmental monitoring records.

1910.1025(n)(5)

***Transfer of records.***

1910.1025(n)(5)(i)

Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by paragraph (n) of this section.

1910.1025(n)(5)(ii)

The employer shall also comply with any additional requirements involving transfer of records set forth in 29 CFR 1910.1020(h).

1910.1025(o)

***Observation of monitoring -***

1910.1025(o)(1)

***Employee observation.*** The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to lead conducted pursuant to paragraph (d) of this section.

1910.1025(o)(2)

***Observation procedures.***

1910.1025(o)(2)(i)

Whenever observation of the monitoring of employee exposure to lead requires entry into an area where the use of respirators, protective clothing or equipment is required, the employer shall provide the observer with and assure the use of such respirators, clothing and such equipment, and shall require the observer to comply with all other applicable safety and health procedures.

1910.1025(o)(2)(ii)

Without interfering with the monitoring, observers shall be entitled to:

1910.1025(o)(2)(ii)(A)

Receive an explanation of the measurement procedures;

1910.1025(o)(2)(ii)(B)

Observe all steps related to the monitoring of lead performed at the place of exposure; and

1910.1025(o)(2)(ii)(C)

Record the results obtained or receive copies of the results when returned by the laboratory.

1910.1025(p)

***Appendices.*** The information contained in the appendices to this section is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation.

[60 FR 52856, Oct. 11, 1995; 61 FR 5507, Feb. 13, 1996; 63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998; 70 FR 1142, Jan. 5, 2005; 71 FR 16672 and 16673, April 3, 2006; 71 FR 50189, August 24, 2006; 73 FR 75585, Dec. 12, 2008; 76 FR 33608, June 8, 2011; 76 FR 80740, Dec. 27, 2011; 77 FR 17780, March 26, 2012; 84 FR 21598, May 14, 2019; 85 FR 8732, Feb. 18, 2020]