

# INDIANA DEPARTMENT OF LABOR

## OSHA General Industry Standard for Beryllium 1910.1024


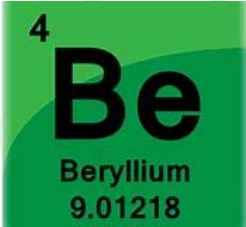
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## Objectives

- Information about beryllium
- New OSHA Permissible Exposure Limits (PEL) for beryllium
- Controls for beryllium
- Medical surveillance



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## Beryllium Characteristics

- Lightweight metal, extremely strong
- Alloys
  - Electrical/thermal conductivity
  - Hardness
  - Corrosion resistance
  - Oxide to make ceramics for electronics/electrical
    - Heat conductivity
    - Strength
    - Hardness
    - Good electrical insulation



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## Beryllium Industries

- Beryllium production
- Beryllium oxide ceramics and composites
- Nonferrous foundries
- Secondary smelting, refining and alloying
- Precision turned products



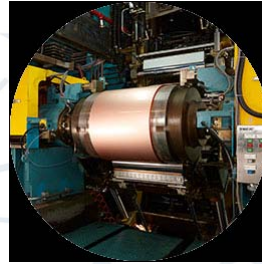
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## Beryllium Industries (cont.)

- Copper rolling, drawing and extrusion
- Beryllium alloy products
- Welding
- Dental offices



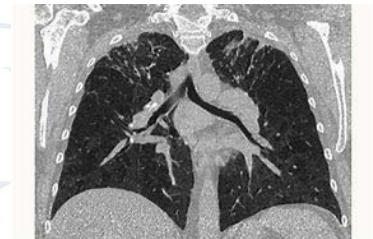
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## Beryllium Health Effects

- Chronic Beryllium Disease (CBD)
  - Pulmonary disease leading to debilitation or death
    - No known cure for CBD
  - Symptoms
    - Shortness of breath
    - Cough
    - Fatigue
    - Weight loss
    - Fever
    - Night sweats
  - Develop quickly or years after exposure
  - Must become sensitized by inhalation or skin exposure



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## Beryllium Health Effects (cont.)

- Lung cancer from dust, fumes or mists
  - Group 1 carcinogen – IARC
  - Human carcinogen – National Toxicology Program
- Sensitization to dust, fumes or mists
  - Chronic – long term exposure
  - Acute – high exposures

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## 1910.1024 Main Features

- New Permissible Exposure Limit (PEL), 8 hr – 0.2 micrograms/m<sup>3</sup>
- New Short Term Exposure Limit (STEL), 15 min. – 2.0 micrograms/m<sup>3</sup>
- Action level for medical surveillance – 0.1 micrograms/m<sup>3</sup>
- Program
  - Control exposures – engineering/work practices (beginning March 10, 2020)
  - Respirators – when controls won't work
  - Limited access to high-exposure areas
  - Written exposure control plan
  - Train workers about beryllium hazards
- Medical examinations and medical removal protection

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## 1910.1024 Compliance Schedule

- May 20, 2017 - final rule effective date
- December 12, 2018 – all provisions enforced except for engineering controls
- March 10, 2020 – engineering controls enforced
- For construction/shipyards – only PELs enforced

SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

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## Beryllium Controls

- Limited access work areas and regulated areas
- Personal protective equipment – storage and cleaning
- Written exposure control plan
- Engineering and work practice controls – below PEL and STEL levels



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## Beryllium Controls (cont.)

- Job rotation not allowed
- Respirators
- Change rooms and showers
- Housekeeping



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## Beryllium Controls – p. 2

- Engineering and work practice controls
  - Substitute another material
  - Work practices
    - Location to dust/fumes
    - Material handling



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## Beryllium Controls – p. 3

- Ventilation
  - Local exhaust
  - General air dilution
  - Combustible dust precautions
    - Dust collection safety – outdoors / devices / collector system
    - Electrical safety
    - Housekeeping
  - Possible high exposures
    - Equipment maintenance and cleaning
      - Use special ventilation or supplied air respirators

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## Beryllium Medical Surveillance

- Detect and eliminate underlying causes
- “Triggers”
  - Greater than 0.1 microgram/m<sup>3</sup> for 30 days in the year
  - Signs or symptoms of CBD
  - Exposure during an emergency (high exposures)
  - Recommendation from an MD, or physician or licensed health care professional (PLHCP) from the most recent exam
- Voluntary for employees
  - If a trigger is met, then surveillance is mandatory

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## Beryllium Medical Surveillance Provisions

- Offered within 30 days of a trigger
  - Every two years if trigger remains
- Contents of medical examination
  - Medical and work history – past and present exposure
  - Physical examination - emphasis on respiratory system/rashes
  - Pulmonary function tests
  - Beryllium lymphocyte proliferation test (BeLPT) or equivalent
  - Any other test deemed appropriate by PLHCP (low dose CT scan)



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## Beryllium Medical Surveillance

- Employer provisions to PLHCP
  - Copy of 1910.1024
  - Job duty descriptions – former/current
    - Related to airborne and dermal contact
    - Former and current levels of airborne exposures
    - PPE, protective clothes and respirators worn. When and how long
    - Previous occupational examinations within control of the employer
      - Written consent of the employee

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## Beryllium Medical Surveillance

- Employee written medical report
  - Results of the examination
    - Detected medical condition
    - Conditions requiring further evaluation or treatment
  - Recommendations on respirator and PPE use
  - Limitations on airborne beryllium exposure
  - Any recommendation for referral to:
    - CBD diagnostic center
    - Continued medical surveillance
    - Medical removal



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## Beryllium Medical Surveillance

- Written report to the employer
  - Date of the examination
  - Statement that the examination results were discussed
    - With employee
    - That the examination met the requirement of the standard
- If
  - Positive sensitization
  - Diagnosed with CBD
  - Or licensed physician provides written authorization
- Then referral to CBD Diagnostic Center or medical removal

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## Beryllium Medical Surveillance

- Diagnosis of Chronic Beryllium Disease
  - Symptoms
  - Work and medical history
  - Medical test – BeLPT
    - Positive factors
      - Two abnormal BeLPT results or
      - An abnormal and a borderline results or
      - Three borderline test results
  - If “confirmed positive” – encourage employee to have further evaluation for CBD

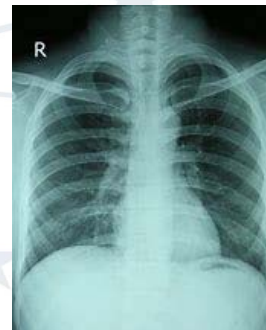
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## Beryllium Medical Surveillance

- Other appropriate tests by a PLHCP
  - Exercise tolerance testing
  - Pulmonary function testing
  - Chest X-ray or CT scan
  - Bloodwork
  - Diagnostic bronchoscopy by lung washing
- Diagnose by:
  - Beryllium sensitization
  - Finding of granulomas
  - Abnormal test in the immune cells



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## CBD Treatment

- No known cure
- Treatment
  - Corticosteroids
  - Oxygen
  - Means to ease symptoms
- Guidance
  - NIOSH Beryllium webpage
  - Department of Energy
    - Chronic Beryllium Disease Prevention Program webpage



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## Summary About Beryllium

- Information about beryllium
- New OSHA Permissible Exposure Limits (PEL) for beryllium
- Controls for beryllium
- Medical surveillance

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Questions?



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## Beryllium Resources

- U. S. Department of Labor/OSHA – [www.osha.gov](http://www.osha.gov)
- National Institute for Occupational Safety and Health Administration (NIOSH) – [www.cdc.gov/niosh](http://www.cdc.gov/niosh). “Preventing Sensitization and Disease from Beryllium Exposure”
- INSafe-State of Indiana Dept. of Labor – [insafe@dol.in.gov](mailto:insafe@dol.in.gov)
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