

# BERYLLIUM FACT SHEET

## for SSPC MEMBERS



- This final rule establishes new permissible exposure limits of:
  - 0.2 micrograms of beryllium per cubic meter of air (0.2  $\mu\text{g}/\text{m}^3$ ) as an 8-hour time-weighted average and 2.0  $\mu\text{g}/\text{m}^3$  as a short term exposure limit determined over a sampling period of 15 minutes.
- OSHA concludes that the final PELs are technologically feasible for all affected industries and application groups.
- OSHA concludes that engineering and work practice controls will be sufficient to reduce and maintain beryllium exposures to the new PELs or below in most operations most of the time in the affected industries.
- For those few operations within an industry or application group where compliance with the PELs cannot be achieved even when employers implement all feasible engineering and work practice controls, use of respirators will be required.
- The final rule also provides an exemption for materials containing less than 0.1% beryllium by weight only where the employer has objective data demonstrating that employee exposure to beryllium will remain below the action level of 0.1  $\mu\text{g}/\text{m}^3$  as an 8-hour TWA under any foreseeable conditions.
- The final rule specifies that exposure monitoring must be repeated within six months where employee exposures are at or above the action level but at or below the TWA PEL, and within three months where employee exposures are above the TWA PEL or STEL.
- The final rule also includes provisions allowing the employer to discontinue exposure monitoring where employee exposures fall below the action level and STEL.
- In addition, the final rule includes a new provision that allows employers to assess employee exposures using any combination of air monitoring data and objective data sufficient to accurately characterize airborne exposure to beryllium (i.e., the “performance option”).
- The final rule now limits the requirement to work areas containing a process or operation that can release beryllium where employees are, or can reasonably be expected to be, exposed to airborne beryllium at any level.

- The final rule expands the exposure requirement to include work areas containing a process or operation where there is potential dermal contact with beryllium based on comments from public health experts that relying solely on airborne exposure omits the potential contribution of dermal exposure to total exposure.
- Respiratory Protection. OSHA has added a provision in the final rule requiring the employer to provide a powered air-purifying respirator (PAPR) instead of a negative pressure respirator where respiratory protection is required by the rule and the employee requests a PAPR, provided that the PAPR provides adequate protection.
- The final rule requires that medical examinations be offered to each employee who is or is reasonably expected to be exposed at or above the action level for more than 30 days per year.
- A trigger to offer periodic medical surveillance when recommended by the most recent written medical opinion was also added to the final rule.
- The final rule requires that medical examinations be offered at least every two years.
- The final rule is effective 60 days after publication.
- All obligations for compliance commence one year after the effective date, with two exceptions: The obligation for change rooms and showers commences two years after the effective date; and the obligation for engineering controls commences three years after the effective date
- Occupational exposure to beryllium can occur from inhalation of dusts, fume, and mist. Beryllium dusts are created during operations where beryllium is cut, machined, crushed, ground, or otherwise mechanically sheared
- Category 4 includes application groups that encounter exposure to beryllium due to trace levels found in dust or fumes that nonetheless can exceed 0.1 µg/m<sup>3</sup> as an 8-hour TWA under foreseeable conditions. The application groups in this category are
  - 1) coal-fired power plants in which exposure to beryllium can occur due to trace levels of beryllium in the fly ash during very dusty maintenance operations, such as cleaning the air pollution control devices;
  - 2) aluminum production in which exposure to beryllium can occur due to naturally occurring trace levels of beryllium found in bauxite ores used to make aluminum; and
  - 3) abrasive blasting using coal and copper slag that can contain 358 trace levels of beryllium.
- Workers who perform abrasive blasting using either coal or copper slag abrasives are potentially exposed to beryllium due to the high total exposure to the blasting media.
- Due to the very small amounts of beryllium in these materials, the final PEL for beryllium will be exceeded only during operations that generate excessive amount of visible airborne dust, for which engineering controls and respiratory protection are already required. However, the other workers in the general vicinity do not experience these high exposures if proper engineering

controls and work practices, such as temporary enclosures and maintaining appropriate distance during the blasting or maintenance activities, are implemented.

- OSHA has determined that workers who perform open-air abrasive blasting using mineral grit (i.e., coal slag) will routinely be exposed to levels above the final PEL (even after the installation of feasible engineering and work practice controls), and therefore, these workers will also be required to wear respiratory protection.
- Based on the record evidence, OSHA cannot conclude that the alternative PEL of  $\mu\text{g}/\text{m}^3$  is achievable most of the time for at least one job category in 8 of the 12 application groups or industries included in this analysis:
  - primary beryllium production;
  - beryllium oxide ceramics and composites;
  - nonferrous foundries;
  - secondary smelting, refining, and alloying, including handling of scrap and recycled materials;
  - precision turned products;
  - dental laboratories;
  - abrasive blasting;
  - and coal-fired electric power generation.
- OSHA has determined that job categories that involve high-energy operations will not be able to consistently achieve  $0.1 \mu\text{g}/\text{m}^3$  (e.g., abrasive blasting with coal slag in open-air).
- These operations can cause workers to have elevated exposures even when available engineering and work practice controls are used.
- OSHA's examination of the record identifies data on beryllium exposure in the abrasive blasting industry showing beryllium exposure above the action level and TWA PEL when beryllium-containing slags are used (e.g., Document ID 1166; 1815, Attachment 35; 1880). And even in abrasive blasting operations where all available controls and work processes to reduce beryllium exposure are used, additional ancillary provisions are still as necessary to protect workers from the harmful effects of exposure to beryllium as in general industry.
- The exposure profile for abrasive blasters shows a median of  $0.2 \mu\text{g}/\text{m}^3$ , a mean of  $2.18 \mu\text{g}/\text{m}^3$ , and a range from  $0.004 \mu\text{g}/\text{m}^3$  to  $66.5 \mu\text{g}/\text{m}^3$ .
- The mean level of  $2.18 \mu\text{g}/\text{m}^3$  is above the preceding PEL for beryllium.
- For pot tenders/helpers, the exposure profile shows a median of  $0.09 \mu\text{g}/\text{m}^3$ , a mean of  $0.10 \mu\text{g}/\text{m}^3$ , and a range from  $0.04$  to  $0.20 \mu\text{g}/\text{m}^3$ .
- Beryllium exposure for workers engaged in abrasive material cleanup shows a median of  $0.18 \mu\text{g}/\text{m}^3$ , a mean of  $1.76 \mu\text{g}/\text{m}^3$ , and a range from  $0.04 \mu\text{g}/\text{m}^3$  to  $7.4 \mu\text{g}/\text{m}^3$  (see Section 12 of Chapter IV in the FEA).
- OSHA concludes that abrasive blasters, pot tenders/helpers, and cleanup workers have the potential for significant airborne beryllium exposure during abrasive blasting operations and

during cleanup of spent abrasive material. Accordingly, these workers require protection under the beryllium standards.