Cal/OSHA Occupational Lead Exposure Prevention for the Construction Industry

Under the California Labor Code and the California Occupational Safety and Health Act, all employers in California are legally required to provide and maintain a safe and healthy workplace for employees.

The California Code of Regulations, title 8, section 1532.1 Lead (T8 CCR 1532.1), is Cal/OSHA's occupational health standard for lead exposures in the construction industry. Its purpose is to protect employees who may be exposed to lead while performing construction work. Cal/OSHA has a separate standard for lead exposures in General Industry – T8 CCR 5198.

The California Lead in Construction regulation emphasizes an increase in the use of protective measures such as substitution, engineering controls and administrative controls, with the goal of providing greater protection for employees from the hazards of lead exposure. Thus, 1532.1 establishes requirements that are more protective than existing federal regulations.

Who Must Comply with this Standard?

The T8 CCR Section 1532.1 regulation applies to all **construction work**:

- Where an employee may be occupationally exposed to lead.
- Excluded from coverage in the general industry standard for lead by T8 CCR 5198 subsection (a)(2).

Construction work is defined as work for construction, alteration and/or repair, including painting and decorating, including:

- Demolition or salvage of structures where lead or materials containing lead are present
- Removal or encapsulation of materials containing lead
- New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead
- Installation of products containing lead
- Lead contamination/emergency cleanup
- Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed
- Maintenance operations associated with the construction activities described in T8 CCR 1532.1 subsection (a)

Worker Exposure

Workers in the construction industry may come into contact with lead when they demolish or salvage buildings with lead or lead-containing materials, remove or encapsulate lead-containing materials, build new buildings with lead or lead-containing materials, or install products containing lead. There are also construction-related activities that may expose workers to lead, such as the transportation, disposal, storage, or containment of lead or materials containing lead on construction sites, and the maintenance operations associated with construction activities.

Who is Most at Risk?

Workers involved in the types of work listed below could be at risk of lead exposure and include:

- Iron work
- Demolition
- Painting and painting-prep
- Lead-based paint abatement
- Heating and air conditioning maintenance and repair
- Electrical
- Carpentry
- Renovation
- Remodeling
- Plumbing

Plumbers, welders, and painters are among those workers most exposed to lead.

T8 CCR Section 1532.1 lists certain tasks that may likely result in exposures to lead above the Permissible Exposure Limit (PEL) and, in some cases, exposures more than 50 times the PEL. These tasks are known as trigger tasks and are described in the Definitions section in 1532.1 Lead (T8 CCR 1532.1).

Workers at the highest risk of lead exposure are those involved in Level 3 trigger tasks, which include:

- Using lead-containing mortar
- Lead burning
- Tasks where lead-containing coatings or paint are present:
  - Rivet busting
  - Power tool cleaning, grinding or sanding without dust collection systems
  - Cleanup activities where dry expendable abrasives are used
  - Abrasive blasting enclosure movement and removal
  - Abrasive blasting*
  - Welding
  - Torch cutting
  - Torch burning

* Notes on Abrasive Blasting

Subsection 1532.1(d) of the lead in construction regulation requires employers to perform exposure assessments for employees who may be exposed to lead at work, to determine their employees' actual exposure. This includes employees who conduct dry abrasive blasting. Until the employer performs the assessment and determines actual employee exposure, the maximum amount of time an employee can conduct dry abrasive blasting is limited to five hours per day, and after January 1, 2030, the amount of time must be limited to 2 hours per day.

Once the employer has performed the required exposure assessment, there is no limit on the maximum amount of time an employee can conduct abrasive blasting, but the employer must ensure employee exposures are below the permissible exposure limit taking into consideration the protection provided by respirators[i] used by employees.

The permissible exposure limit[ii] for abrasive blasting is 25 micrograms of lead per cubic meter of air until January 1, 2030. Starting January 1, 2030, the permissible exposure limit is 10 micrograms per cubic meter.

For example, if employees are correctly using respirators with a protection factor of 1,000 at all times, air concentrations[iiii] of lead up to 25,000 micrograms per cubic meter are permitted for abrasive blasting until January 1, 2030. A protection factor of 1000 would reduce air concentrations of lead at 25,000 micrograms per cubic meter to a concentration of 25 micrograms per cubic meter inside the respirator. Starting January 1, 2030, the maximum air concentration allowed for abrasive blasting will be 10,000 micrograms per cubic meter for employees correctly using a respirator with a protection factor of 1,000 at all times.

The protection provided by respirators is listed in Table 1 of section 5144 Respiratory Protection. Below is a copy of the table.

Section 5144 Table 1 - Assigned Protection Factors[5]

Type of respirator[1 2]	Quarter mask	Half mask	Full facepiece	Helmet/hood	Loose-fitting facepiece
1. Air-Purifying Respirator	5	[3] 10	50		
2. Powered Air-Purifying Respirator (PAPR)		50	1,000	[4] 25/1,000	25
3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode		10	50		
• Continuous flow mode		50	1,000	[4] 25/1,000	25
• Pressure-demand or other positive-pressure mode		50	1,000		
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode		10	50	50	
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)			10,000	10,000	

Notes

1. Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.
2. The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section, including training, fit testing, maintenance, and use requirements.
3. This APF category includes filtering facepieces, and half masks with elastomeric facepieces.
4. The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a Workplace Protection Factor (WPF) or simulated WPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.
5. These APFs do not apply to respirators used solely for escape. For escape respirators used in association with substances covered by substance-specific standards in Title 8, Division 1, Chapter4, Subchapters 4, 7, and 18, employers must refer to the appropriate substance-specific standards. Escape respirators for other IDLH atmospheres are specified by subsection (d)(2)(B).

Other operations, where lead-containing coatings or paint are present, with the potential to expose workers to lead include Level 1 and 2 tasks, such as:

- Manual demolition of structures (e.g., dry wall)
- Manual scraping
- Heat gun applications
- Manual sanding
- Power tool cleaning, grinding or sanding with dust collection systems
- Spray painting with lead paint

[i] The protection factors assigned to respirators are only valid if used in accordance with section 5144./p>

[ii] The permissible exposure limit is measured as an eight-hour time-weighted average concentration.

[iii] Air concentration measured as an eight-hour time-weighted average concentration.

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