

**OCCUPATIONAL SAFETY
AND HEALTH STANDARDS BOARD**

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**INITIAL STATEMENT OF REASONS****CALIFORNIA CODE OF REGULATIONS**

Title 8: Section 5155 of the General Industry Safety Orders

Airborne Contaminants - Benzyl Chloride**SUMMARY**

Labor Code Section 144.6 requires that the Occupational Safety and Health Standards Board (Board), when dealing with standards for toxic materials and harmful physical agents, adopt standards which most adequately assure, to the extent feasible, that no employee suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard for the period of their working lifetime. This section also requires that the Board base standards on research, demonstrations, experiments and other information as may be appropriate. Labor Code Section 144.6 also lists other considerations such as the latest scientific literature, the reasonableness of the standards, and experience gained under this and other health and safety laws.

With the assistance of an advisory committee, the Division of Occupational Safety and Health (Division) develops proposals to amend airborne exposure limits known as Permissible Exposure Limits (PELs). This ongoing review is necessary to take into account changes in the information available to assess the health effects of exposures to airborne substances that can be present in the workplace.

The Division proposes to reduce the existing 8-hour time-weighted average (TWA) PEL of 1 part per million (ppm) to 0.03 and the 5 milligrams per cubic meter of air (mg/M^3) to 0.16 mg/M^3 for benzyl chloride.

Regulations, Laws, and Other Standards**Existing Title 8 Regulations**

Section 5155 establishes minimum requirements for controlling employee exposure to specific airborne contaminants. This section specifies several types of airborne exposure limits, including limits on exposures as an 8-hour (TWA), short term exposure limits (STELs), and ceiling limits. Section 5155 also contains requirements for measurement of workplace airborne exposures and, in certain situations, medical surveillance. For benzyl chloride, the existing TWA PEL is 1 ppm ($5 \text{ mg}/\text{M}^3$).

Labor Code

Labor Code Section 147.1 requires the Division to maintain surveillance and propose standards to the Board. The Division relies in part on changes made to the Threshold Limit Values (TLVs) published by the American Conference of Governmental Industrial Hygienists (ACGIH) as a source for possible amendments to consider to Section 5155.

Federal OSHA Regulations and Other Standards

The Federal Occupational Safety and Health Administration (OSHA) has a Permissible Exposure Limit (PEL) for benzyl chloride. The PEL in Title 29 CFR, Section 1910.1000 for benzyl chloride is 1 ppm which is the same as the current Section 5155 PEL and is less protective than the proposed PEL for benzyl chloride.

SPECIFIC PURPOSE AND FACTUAL BASIS OF PROPOSED ACTION

The Division, in developing this and past proposals for amendments to Section 5155, convened advisory committees to consider and make recommendations on a list of substances. These advisory committees assist the Division in evaluating and interpreting the studies and other scientific information listed in the Documents Relied Upon section that forms the factual basis of proposals for revisions to Section 5155. The advisory committees for PELs also provide an additional avenue for involvement in the rulemaking process by employers and worker representatives, and by other communities that can be affected by revisions to Section 5155.

The health basis of the PEL for benzyl chloride was discussed by the Division's Health Expert Advisory Committee (HEAC) for PELs at two public meetings in March 2010 and June 2010. After the HEAC discussions concluded, feasibility and cost issues were addressed at a public meeting of the Division's Feasibility Advisory Committee (FAC) on October 6, 2010. Minutes of the HEAC and FAC meetings are posted on the Internet. The website address for 2009-2010 meetings is http://www.dir.ca.gov/dosh/DoshReg/5155Meetings_2009.htm.

This regulatory proposal is intended to provide worker safety at places of employment in California.

An amended PEL for benzyl chloride is proposed to consist of an 8-hour TWA of 0.03 ppm (0.16 mg/ M³). These amended exposure limits are necessary to assure, to the extent feasible, that no employee will suffer material impairment of health or functional capacity from exposure to these materials over a working life.

Benzyl chloride is used in the manufacture of benzyl compounds, perfumes, pharmaceutical products, dyes, synthetic tannins, artificial resins, photographic developer, gasoline gum inhibitors, penicillin precursors, and quaternary ammonium compounds. According to the most recently available employment statistics, no more than about 41,000 workers in the United States

are potentially exposed to benzyl chloride¹. Using the BLS estimate of California having approximately 12% of the business establishments in the US², adjusted for population increase of 1.44 from 1983 to 2015 (<http://www.labormarketinfo.edd.ca.gov> December 2014), the Division estimates that less than 7,100 California workers in approximately 600 businesses are likely to be affected by the lowered PELs.

The American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values (TLV) for benzyl chloride was set at 1 ppm (5.2 mg/M³) to prevent lung injury and irritation of the eye, nose and throat, based on an AIHA Hygienic Guide (Smyth 1956) summary of human sensory data which established that 1ppm was an appropriate threshold to protect workers from irritation. Carcinogenicity was described in the documentation but was not considered as an endpoint for setting the TLV, however it resulted in benzyl chloride being labeled as an A3 carcinogen (confirmed animal carcinogen with unknown relevance to humans). On January 1, 1990, benzyl chloride was added to the “Proposition 65” list of substances known to the state of California to cause cancer.

The HEAC recommended PEL for benzyl chloride is 0.03 ppm 8-hour TWA to protect against the potential for excess cancer risk at the current TLV and Section 5155 PEL of 1 ppm. The point of departure for the former TLV and PEL is eye and respiratory tract irritation which is believed to still be protective of the non-cancer endpoints reported and evaluated. However, the U.S. Environmental Protection Agency, Integrated Risk Information System risk assessment for cancer was used to calculate a concentration that would not increase the risk to workers from inhalation exposure during their working lifetime beyond 1 in 1000 cancer risk. If an 8-hour PEL of 1 ppm yields a cancer risk of 32 in 1,000, then a PEL associated with a cancer risk of 1 in 1,000 would be 0.03 ppm. The proposed 0.03 ppm would also protect against all endpoints studied such as mild eye and respiratory tract irritation. Details of the HEAC discussion are available in the minutes for the meetings at which benzyl chloride was discussed.

This rulemaking proposes revisions of the PEL for the chemical substance benzyl chloride. The primary users of this substance are the private industrial and chemical sectors and it is present in some petroleum products. The PEL proposed is consistent with recent scientific findings, of which professional health and safety staff and consultants of these employers and others with significantly exposed employees should be aware. Many of these entities already seek to control employee exposures to chemicals to levels below existing PELs in the interest of business continuity and minimization of tort and workers compensation liability. In light of this, the additional expenditures by these entities to comply with the proposed amended PEL are estimated to be no more than \$60,000 per employer that is not already in compliance with existing regulations. Informal comments on potential cost impacts were actively sought in the course of development of this proposal and a FAC public meeting was held specifically to receive such comments verbally and to provide an opportunity for commenter discussion. No comments were provided during the FAC or by interested parties.

¹ See Documents Relied Upon Item #2

² See Documents Relied Upon Item #3

Based on discussions with NIOSH and Fed/OSHA Methods Development Team, sampling for the proposed PEL is feasible. Providing suitable control measures such as ventilation to control exposure can be achieved using existing equipment as most systems have the ability to control to the proposed levels.

TECHNICAL, THEORETICAL AND/OR EMPIRICAL STUDIES, REPORTS OR DOCUMENTS RELIED ON BY THE BOARD

1. California Employment Development Department OES Employment Data Tables, Third Quarter 2014. <http://www.labormarketinfo.edd.ca.gov>
2. Centers for Disease Control (CDC) National Occupational Exposure Survey (NOES), Estimated Numbers of Employees Potentially Exposed to benzyl chloride, 1981-83.
3. United States Bureau of Labor Statistics (BLS), Economy at a Glance, June 2015.
4. U.S. Environmental Protection Agency. Integrated Risk Information System (IRIS) risk assessment document. (Last revised 10/28/2003).
<http://www.epa.gov/iris/subst/0393.htm>.
5. U.S. Department of Labor, Preambles to Final Rule on 29 CFR Part 1910, Air Contaminants. Published in the Federal Register Vol. 54 FR 2332, Jan. 19, 1989.
https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=PREAMBLE&p_toc_level=1&p_keyvalue=Air~Contaminants.
6. Minutes of the HEAC meeting held on March 24, 2010, and sign-in sheets.
http://www.dir.ca.gov/dosh/DoshReg/5155Meetings_2009.htm.
7. Minutes of the HEAC meeting held on June 23, 2010, and sign-in sheets and summary report on benzyl chloride dated May 25, 2010 by Susan Ripple.
http://www.dir.ca.gov/dosh/DoshReg/5155Meetings_2009.htm.
8. Minutes of the Feasibility Advisory Committee (FAC) meeting held on October 6, 2010, and sign-in sheets.
http://www.dir.ca.gov/dosh/DoshReg/5155Meetings_2009.htm.
9. ACGIH TLV Documentation, benzyl chloride (CAS Number: 100-44-7), 2001.
10. Smyth HF Jr [1956]. Improved communication: hygienic standards for daily inhalation. American Industrial Hygienist Association Q 17(2):129-185.

These documents are available for review Monday through Friday from 8:00 a.m. to 4:30 p.m. at the Board Office located at 2520 Venture Oaks Way, Suite 350, Sacramento, California.

DOCUMENTS INCORPORATED BY REFERENCE

None.

PETITION

This proposal was not the result of a petition.

ADVISORY COMMITTEE

This proposal was developed with the assistance of an advisory committee. (Minutes and attendance sheets are included as Documents Relied Upon.)

FIRE PREVENTION STATEMENT

This proposal does not include fire prevention or protection standards. Therefore, approval of the State Fire Marshal pursuant to Government Code Section 11359 or Health and Safety Code Section 18930(a)(9) is not required.

SPECIFIC TECHNOLOGY OR EQUIPMENT

This proposal will not mandate the use of specific technologies or equipment.

ECONOMIC IMPACT ANALYSIS/ASSESSMENT

The Division has made a determination that this proposal is not anticipated to result in a significant, statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states. This proposal will not have any effect on the creation or elimination of California jobs nor result in the creation or elimination of existing businesses or affect the expansion of existing California businesses. The Division anticipates that any potential costs will be balanced by avoiding or minimizing the costs inherent in workers' compensation claims, lost work time, and productivity losses that would have been caused by cancer related illness of employees.

The PEL proposed is consistent with recent scientific findings, of which professional health and safety staff and consultants of these employers and others with significantly exposed employees should be aware. Many of these entities already seek to control employee exposures to chemicals to levels below existing PELs in the interest of business continuity and minimization of tort and workers compensation liability. In 1989, Federal OSHA estimated that approximately 11% of employers using the listed chemicals would incur a one-time cost of approximately \$60,000/employer as a result of the revision or addition of PEL's for 376 chemicals in their 1910.1000, Tables Z-1, Z-2, and Z-3 (https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=PREAMBLES&p_toc_level=1&p_keyvalue=Air~Contaminants). Even though this estimate was done in 1989, the average cost of \$60,000 per affected employer and \$31,000 per small affected employer is considered a high estimate, since this proposal only recommends changes to one chemical.

Based on the assumptions used in the final rule, 12% of the estimated 600 employers in California expected to be using benzyl chloride, leaves approximately 70 employers that would incur this \$60,000 cost for a total of \$4,200,000 in one-time costs as a result of this proposed PEL. Although they did not quantify the benefits, Federal OSHA also estimated that these costs would be more than offset by savings incurred from improved employee health and productivity. To update the 1989 estimates and obtain California specific data, advisory comments on potential cost impacts were actively sought in the course of development of this proposal and a FAC public meeting was held specifically to receive such comments verbally and to provide an opportunity for commenter discussion. No comments were provided during the FAC or by interested parties.

The economic benefits from the proposed PEL will result primarily from reduced cancer risk among exposed workers. Under the existing regulation, the cancer risk is estimated at 32 cases per 1000 workers exposed over their working lifetime. The proposed PEL will reduce the cancer risk to 1 case per 1000 workers exposed over their working lifetime. The proposal potentially prevents 31 cancers per 1000 workers for an approximate total of a reduction of 220 cancer cases among the 7,100 exposed workers. Based on the benefit estimates in the federal OSHA final rule, the total benefit for the cancers prevented would far exceed the \$4,200,000 cost estimated for this proposal.

BENEFITS OF THE PROPOSED ACTION

The Division believes that employees in these industries in California will benefit from improved respiratory health, and a reduced cancer risk as a result of the adoption of this amended PEL. Employers will benefit from improved work attendance by employees due to improved respiratory health.

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EVIDENCE SUPPORTING FINDING OF NO SIGNIFICANT STATEWIDE ADVERSE ECONOMIC IMPACT DIRECTLY AFFECTING SMALL BUSINESSES

The Division has determined that the proposed amendments are not anticipated to have significant statewide adverse economic impact directly affecting businesses. As described above, the average cost of \$60,000 per affected employer and \$31,000 per small affected employer will be more than offset by the anticipated economic benefits derived from the reduced cancer risk.

**REASONABLE ALTERNATIVES TO THE PROPOSAL AND THE BOARD'S
REASONS FOR REJECTING THOSE ALTERNATIVES**

No reasonable alternatives have been identified by the Division or have otherwise been identified and brought to its attention that would be more effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

Labor Code Section 144.6 provides, in part, that standards dealing with toxic materials be adopted that are most adequately protective of employee health “to the extent feasible”. Discussions were held in public meetings with advisory committees for both health and feasibility assessment. These discussions addressed a number of factors relevant to consideration of a particular value for the PEL proposed in this rulemaking. These discussions are described in the minutes included in the documents relied upon. Labor Code Section 144.6 also provides that whenever practicable, standards for toxic materials be expressed in terms of objective criteria and of the performance desired. The proposal in this rulemaking is consistent with that stated preference in that it does not require particular specified equipment or methods for exposure level control, but rather provides an objectively stated performance criterion with affected employers determining the alternatives to use to achieve compliance in their particular operations involving employee exposure to the toxic material. The preference of Labor Code Section 144.6 for performance based standards for toxic materials is consistent with the same stated preference contained in such Government Code Section 11340.1(a).