



Safe Work Australia – Regulation of Welding Processes

Cancer Council Australia

17 July 2026



About Cancer Council

Cancer Council is the peak, non-Government cancer control organisation in Australia. As the national body in a federation of eight state and territory member organisations, Cancer Council Australia works to make a lasting impact on cancer outcomes by:

- shaping and influencing policy and practice across the cancer control continuum;
- developing and disseminating evidence-based cancer information;
- convening and collaborating with cross sectorial stakeholders and consumers to set priorities; and;
- speaking as a trusted voice on cancer control in Australia.

Cancer Council acknowledge the traditional custodians of the lands on which we live and work. We pay respect to Aboriginal and Torres Strait Islander Elders past, present and emerging and extend that respect to all other Aboriginal and Torres Strait Islander people.



This submission was authorised by:

Name: David Martin

Title: Director, Cancer Control Policy, Cancer Council Australia

On behalf of Jacinta Reddan, Chief Executive Officer, Cancer Council Australia

1. Our position

Summary of recommendations

1. Develop new welding-specific regulations in the model WHS Regulations (Approach 1)
2. Introduce welding-specific regulations proposed in section 4 of the Consultation Paper
3. Introduce requirements proposed in the Consultation Paper that applies Part 3.1 of the Regulations to welding
4. Elevate key requirements from the *Code of Practice: Welding Processes* into the model WHS Regulations
5. Implement regulations to capture new and emerging technologies without the need for ongoing amendments

Cancer Council's Occupational and Environmental Cancer Committee (the Committee) includes members with national standing in relevant disciplines including epidemiology, molecular biology, occupational health, occupational hygiene, clinical oncology, and public health. We welcome the opportunity to provide feedback addressing the *Regulation of Welding Processes* consultation paper. This submission provides Safe Work Australia with the views of the Committee, on behalf of Cancer Council on the above matter.

Cancer Council commends Safe Work Australia for examining the risks associated with welding processes and undertaking this consultation on potential amendments to the model Work Health and Safety (WHS) Regulations to better protect workers and others in the workplace from welding-related hazards.

Exposure to welding hazards should be reduced to as low as reasonably practicable to protect workers and minimise their risk of developing welding-related injury and disease. As per our mission, our interest is in reducing the incidence of lung cancer from exposure to welding fumes and ocular melanoma from exposure to ultraviolet (UV) radiation from the welding arc / laser.

Cancer Council believes that all Australians should be able to go about their working lives without increasing their risk of developing cancer. We strongly support the right to a safe and healthy workplace and to the highest standards of employee protection. Given that cancers often have a long latency period between the time of exposure and the development of symptoms and diagnosis, the model WHS Act and Regulations must protect workers not only from immediate injuries but also from diseases, such as occupational cancers, which may not become apparent for many years.

In line with this, we strongly support **making new welding-specific regulations in the model WHS Regulations (Approach 1)**, to be adopted consistently across all Australian jurisdictions and applied to all relevant industries.

Specifically, we support the introduction of the welding-specific regulations proposed in section 4 of the Consultation Paper. As noted in the Consultation Paper, the proposed regulations would largely clarify and reinforce existing requirements in the Model WHS Regulations, while elevating key guidance from the Code into the regulations. The available evidence in Australia indicates that reliance on the *Code of Practice: Welding Processes* alone is insufficient, reinforcing the need to elevate key requirements into the model WHS Regulations to establish clearer, enforceable obligations. Additionally, we recommend that the welding-specific regulations be technology neutral to capture new and emerging technologies without the need for ongoing amendments. We consider this to be a practical and proportionate approach that would help provide clarity for Persons Conducting a Business or Undertaking (PCBU) regarding their obligations, strengthen protections for workers, and improve compliance, while avoiding significant additional costs and requirements for duty holders who are already managing risks in accordance with the WHS regulations and the Code.

Furthermore, we support the requirements proposed in the Consultation Paper that applies Part 3.1 of the Regulations to welding (including the hierarchy of control measures) and that requires PCBUs to:

- provide appropriate training on welding processes prior to starting work
- provide information about health and safety risks of welding prior to engaging in work
- display safety signs when welding
- conduct a documented risk assessment prior to commencement of welding work
- restrict access to welding work area.

To maximise the effectiveness of the proposed reforms, it is essential that the *Code of Practice: Welding Processes* is reviewed and updated alongside the new regulations to ensure alignment and support effective implementation and compliance.

We consider this to be a necessary and proportionate response to the key issues identified in the Consultation Paper, namely challenges in applying effective controls, the complexity in identifying and communicating hazards and risks, and exposure to radiation generated by welding and emerging risks from newer technologies.

Our support for this approach is based on four key considerations, which are outlined below.

2. Evidence supporting this approach

Welding generates multiple carcinogenic hazards

The International Agency for Research on Cancer (IARC) provides the most authoritative information available worldwide about chemicals suspected of causing cancer in humans; the most recent evaluation published in 2018 determined that welding fumes and UVR from welding are carcinogenic to humans (Group 1) and cause lung cancer and ocular melanoma, respectively. Positive associations have also been observed between welding fumes and kidney cancer.¹

Welding fumes may also include individual components that are hazardous, including beryllium, cadmium, chromium VI compounds and nickel compounds, which have all been classified as Group 1 carcinogens by IARC.¹ Each of these four agents are included in the list of 38 priority carcinogens relevant to working conditions in Australia.² Additionally, welding fumes are linked with a range of other health issues such as metal fume fever, chronic obstructive pulmonary disease, asthma, pneumonia, and neurological effects.

The composition of welding fumes and extent of exposure varies depending on a number of factors. This includes the welding technique and materials involved, the power settings, how confined/restricted the space is in which the welding takes place, the length of time spent welding, the welders' physical position and experience, and the employer's provision, and worker's use, of control measures such as local exhaust ventilation and personal protective equipment (PPE).¹ Likewise, exposure to UV radiation is influenced by a range of factors such as the type of welding, intensity and duration of the radiation, distance from the radiation, and use of appropriate protective gear. The wide range of factors influencing welding fume composition and UV radiation levels also contributes to the complexity of managing exposure to welding hazards in the workplace and highlights the need for clear regulatory requirements and control measures.

Awareness of cancer risks remains low

Although welding is a common work activity in many Australian industries and workplace, there is a clear lack of awareness about the carcinogenic effects of welding among workers and employers. A study by Carey and colleagues published in 2023 highlighted a persistent lack of awareness within the welding industry regarding the health risks of exposure to welding fumes, including a lack of awareness that welding fumes were reclassified as carcinogenic by IARC. In particular, participants thought that awareness was low among workers who had trained overseas and among young workers who were not receiving enough information on health risks, while they also noted that employers' awareness of the hazards of welding fume exposure was an issue.³ Additionally, an earlier survey of more than 2400

Australian and New Zealand welders conducted by Australian Welding Supplies in 2020 revealed that 37% of welders did not know that welding fume had been declared as a carcinogen by IARC.⁴

High levels of occupational exposure

Concerningly, Fritschi and colleagues recently surveyed 634 workers and employers involved in welding in Australia and found that over 90% of welders are exposed to welding fumes. Of these, a further 76% were deemed to be exposed at high levels. This equates to at least 46,000 Australian welders being exposed to high levels of welding fumes at work every year.⁵ With respect to UV radiation, the researchers reported that dermal UV radiation exposure occurred in 7.8% of welders (n=42/541) and 14.4% of supervisors (n=24/166), whereas ocular UV radiation exposure occurred in 16.8% of welders (n=91/541) and 33.1% of supervisors (n=55/166).⁶

Driscoll and co-workers then conducted a study where they visited 20 workplaces in New South Wales to collect personal and static samples of welding fume particulates and gases while welding was being undertaken. Of the total fume particulate measurements available for 62 welders, 41 (66%) measurements were equal to or above the new workplace exposure standard (WES) of 1.0 mg/m³ (range 1.1 – 13.4 mg/m³), with 17 of 19 workplaces having at least one welder with a measurement of 1.0 mg/m³ or more.⁷

In June this year, WorkSafe WA reported that approximately two thirds of welding fume samples submitted to the department in 2024-25 exceeded the WES of 1mg/m.^{3,8} Previously, data published by the WA Department of Mines, Industry Regulation and Safety revealed that 12% of welding fume samples they received over the course of the previous year had exceeded the then WES for welding fumes NOC of 5mg/m.³ Furthermore, well over half of the samples would have exceeded the reduced WES of 1mg/m.^{3,9} However, outside of WA, there is a paucity of publicly available data from WHS regulators relating to levels of exposure to welding fume in Australia.

Inadequate and inconsistent use of control measures

It is evident that there is currently a poor use of control measures to reduce exposure to welding fumes in industry, including limited use of mechanical ventilation (such as on-tool extraction or local exhaust ventilation using a moveable arm) and air-supplied respiratory protection. In the survey by Fritschi and co-workers, only 18.9% of welders (n=102/541) reported using a welding booth or exhaust hood and only 38.8% (n=169/436) of those who did not use ventilation controls wore an air supplied welding helmet. A majority of welders (86.3%; n=467/541) reported that they would weld while leaning over the welding site.⁵

Furthermore, a key theme identified by Carey and colleagues was the inadequate use of control measures to manage exposure to welding fumes. Notably, ventilation was found to be very poorly used, with many participants reporting that it was either inadequate or non-existent, even in new purpose-built workshops. Where controls such as powered air purifying respirators and ventilation were available, they were often used ineffectively or poorly implemented, thus limiting their ability to reduce exposure and protect workers.³

Of the 20 workplaces visited by Driscoll and co-workers, natural ventilation was the only form of ventilation used in ten workplaces, five used a combination of natural ventilation and pedestal fans to move air away from the immediate welding area, (but often into nearby work areas where other workers might be) while the other five used various combinations of extraction fans and local exhaust ventilation. The use of respiratory protective equipment was inconsistent, with 36 of 67 welders (54%) using powered air purifying respirators (PAPRs) at least some of the time when welding, 16 (24%) using half-face reusable respirators, while 15 (22%) used no respiratory protection while welding.⁷

Similarly concerning results were reported in the Australian Welding Supplies 2020 survey which revealed that 32% of welders did not use respiratory protection when working. Overall, 80% of welders felt that they were not protected from welding fume at work, with cost considered to be the most significant

factor deterring workplaces from implementing more stringent controls, and 65% of welders are already paying for their own respiratory protection.⁴

Previously, a 2018 investigation by the NSW Resources Regulator revealed that mine operators were inconsistently applying the hierarchy of controls in respect of welding, with insufficient consideration and implementation of higher order controls such as local exhaust ventilation. Instead, there was an over-reliance on natural dilution ventilation or fan-forced ventilation to dilute fumes without considering other workers in the area. Among other issues, the investigation also identified workers were not always provided with adequate information, training and instruction regarding the carcinogenic risks and appropriate controls for welding processes.¹⁰ Four years later, inspections conducted in 2022 found that these failings had largely persisted in the NSW mining industry, with continued reliance on natural dilution ventilation as the primary method of ventilation, inadequate use of personal protective equipment, and poor implementation and maintenance of local exhaust ventilation systems.¹¹

3. Conclusion

In summary, Cancer Council strongly supports the introduction of new welding-specific regulations as proposed in the Consultation Paper. The evidence demonstrates that welding exposes workers to multiple carcinogenic hazards, awareness of these carcinogens remains insufficient, workers continue to be exposed at high levels, and effective controls are inconsistently implemented. Together, these findings indicate that reliance on the *Code of Practice: Welding Processes* alone is insufficient, reinforcing the need to elevate key requirements into the model WHS Regulations to establish clearer, enforceable obligations. The proposed amendments represent a necessary and proportionate response to these challenges, which have the potential to improve compliance, strengthen the application of the hierarchy of controls, reduce occupational exposure to welding fumes and UV radiation, and better protect the health of workers across all industries where welding occurs. Doing so will help uphold the fundamental right that all Australians should be able to go about their working lives without increasing their risk of developing cancer.

4. References

- ¹ International Agency for Research on Cancer. IARC monographs on the evaluation of carcinogenic risks to humans. Welding, Molybdenum Trioxide, and Indium Tin Oxide. Volume 118. Lyon, France: IARC, 2018.
- ² Fernandez RC, Driscoll TR, Glass DC, Vallance D, Reid A, Benke G, et al. A priority list of occupational carcinogenic agents for preventative action in Australia. *Aust N Z J Public Health*. 2012;36(2):111-5.
- ³ Carey RN, Fritschi L, Nguyen H, Abdallah K, Driscoll TR. Factors Influencing the Use of Control Measures to Reduce Occupational Exposure to Welding Fume in Australia: A Qualitative Study. *Safety and Health at Work*. 2023; 14(4): 384-389. doi: 10.1016/j.shaw.2023.09.001
- ⁴ Australian Welding Supplies. 2020 Welding Fume & Respiratory Protection Survey. Australian Welding Supplies, 2020.
https://www.awsi.com.au/media/literature/whitepaper/2020_10_Welding_Fume_Survey_1025249796.pdf
- ⁵ Fritschi L, Driscoll TR, Nguyen H, Abdallah K, Carey RN. Occupational exposure to welding fume in Australia: An online survey. *Aust N Z J Public Health*. 2024;48(4):100165. Available from:
<https://doi.org/10.1016/j.anzjph.2024.100165>
- ⁶ Fritschi L, Driscoll T, Nguyen H, Carey RN. Occupational exposure to artificial ultraviolet radiation from welding in Australia. *Int J Prev Med*. 2024;15:43. Available from:
https://doi.org/10.4103/ijpvm.ijpvm_250_23

-
- ⁷ Driscoll TR, Paine S, Fritschi L, Nguyen H, Carey RN. Occupational exposure to welding fume in Australian workplaces. *Ind Health*. 2026;64(2):137–148. Available from: <https://doi.org/10.2486/indhealth.2025-0048>
- ⁸ WorkSafe WA. Health and Safety Bulletin No. 26: Reducing exposure to carcinogenic welding fumes [Internet]. Perth, WA: WorkSafe WA; 2026 Jun 25 [cited 2026 Jul 3]. Available from: <https://www.worksafe.wa.gov.au/system/files/documents/2026-06/health-and-safety-bulletin-no-26-reducing-exposure-to-carcinogenic-welding-fumes.pdf>
- ⁹ Department of Mines, Industry Regulation and Safety. Mines Safety Bulletin No. 154 Managing long-term exposure to carcinogenic welding fumes [Internet]. Perth, WA: Government of Western Australia; 2018. Available from: <https://www.worksafe.wa.gov.au/publications/mines-safety-bulletin-no-154-managing-long-term-exposure-carcinogenic-welding-fumes>
- ¹⁰ NSW Resources Regulator. **Safety bulletin: welding processes declared a carcinogen** [Internet]. Sydney: NSW Resources Regulator; 2018. Available from: <https://www.resourcesregulator.nsw.gov.au/sites/default/files/documents/sb18-17-welding-fume-safety.pdf>
- ¹¹ NSW Resources Regulator. **Safety bulletin: welding fume extraction fans** [Internet]. Sydney: NSW Resources Regulator; 2022. Available from: <https://www.resourcesregulator.nsw.gov.au/sites/default/files/2022-01/Welding-fume-extraction-fans.pdf>