

Laser Welding and Laser Cleaning in Australia: Legal and Regulatory Requirements by State and Territory

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This article is a factual research brief and is not legal advice. It summarises publicly available regulatory materials at the time of writing.

Executive Summary

Australian obligations for industrial laser welding and laser cleaning are primarily governed by each jurisdiction's workplace health and safety framework:

- **Victoria** operates under the **Occupational Health and Safety (OHS)** regime.
- All other states and territories, including the Commonwealth, operate under **harmonised Work Health and Safety (WHS)** legislation.

Under these frameworks, lasers are generally regulated as **plant**, but **Class 3B and Class 4 lasers are also subject to specific provisions under WHS Regulation clause 223**, which impose strict controls—particularly in **construction work**, where their use is typically prohibited.

Across most jurisdictions:

- There is **no standalone "laser operator licence"** under WHS/OHS law.
- There is **no general plant registration requirement for lasers as a category**, unless the system incorporates other registrable plant (e.g. pressure equipment, cranes, lifts).
- However, **additional restrictions apply in construction settings**, particularly under WHS laws, where Class 3B and Class 4 lasers are generally prohibited.

Two jurisdictions impose **additional laser-specific public health/radiation regimes**:

Western Australia

- Regulated under the **Radiation Safety Act 1975** and **Radiation Safety (General) Regulations 1983**.
- Requires compliance with a legislated "laser safety standard" (historically AS/NZS 2211.1:2004).
- In practice, the **Radiological Council requires compliance with AS/NZS IEC 60825.1** and mandates:
 - Registration for **Class 3B and Class 4 lasers**
 - Licensing for manufacture, sale, possession and use
- Prescriptive **premises controls for Class 4 lasers** include:

- Beam enclosure and interlocks
- Controlled areas
- Warning signage and alarms
- Key control systems

Tasmania

- The **Radiation Protection Act 2005** defines:
 - “Radiation” to include **non-ionising radiation**
 - “Radiation apparatus” broadly (equipment producing radiation when energised)
- Industrial lasers fall within this definition.
- Requirements include:
 - **Licence to deal with a radiation source**
 - **Registration of premises** where the laser is used or stored

Across all jurisdictions, employers/PCBUs must:

- Identify hazards
- Eliminate risks so far as reasonably practicable (SFARP)
- Otherwise minimise risks using the **hierarchy of controls**

For lasers, this includes:

- Preventing **any hazardous exposure** (direct, reflected, diffuse, or secondary emissions such as plasma-generated UV) so far as reasonably practicable
- Implementing engineered controls such as:
 - Enclosures
 - Interlocks
 - Beam attenuation/termination
 - Access control systems

Laser Welding vs Laser Cleaning

- **Laser welding** is explicitly addressed in welding safety guidance, including radiation hazards.
 - **Laser cleaning** is generally not separately defined in legislation, but:
 - The same beam hazard controls apply
 - Additional risks arise from **ablation by-products** (e.g. coatings, oxides, paints, heavy metals)
 - This introduces requirements for:
 - Local exhaust ventilation
 - Filtration systems
 - Respiratory protection (where required)
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National Framework and Key Standards

Australia's WHS system is jurisdiction-based, with **Safe Work Australia (SWA)** providing guidance materials only (not enforcement).

Laser safety in practice is informed by the following standards:

- **AS/NZS IEC 60825.1:2014** – Equipment classification and product safety requirements
- **AS/NZS IEC 60825.14:2022** – User guidance and control measures

Important clarification:

- **Part 1 (60825.1)** is a **product standard**, not a control framework.
- **Part 14 (60825.14)** provides the **relevant guidance for safe use and control measures**.

In construction contexts, SWA references **AS 2397:2015**, however:

- This standard **excludes Class 3B and Class 4 lasers**, making it **not applicable to laser welding/cleaning systems**.
- WHS Regulation **clause 223** effectively governs these lasers in construction settings.

Laser Pointer Import and Possession Controls

At a national level:

- The **Australian Border Force** regulates import of laser pointers under weapons controls.
- Defined as handheld devices exceeding **1 mW output**.
- Import typically requires a **B710 permit**.

At a state level:

- Additional **possession and use restrictions** apply.
- These vary significantly and may extend to:
 - Public possession without reasonable excuse
 - Broader interpretations of "laser pointer" (potentially including certain handheld industrial devices)

Jurisdiction Comparison (Summary)

Common Themes (All Jurisdictions)

- No general laser operator licence under WHS/OHS
- No plant registration requirement for lasers as a class

- **Mandatory:**
 - Risk management
 - Training and competency
 - SFARP-based control measures
 - **Clause 223 (WHS):**
 - Class 3B and 4 lasers **generally prohibited in construction work**
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Key Jurisdictional Differences

New South Wales (WHS)

- No laser-specific licensing regime
- Strong enforcement of:
 - **Clause 223 restrictions**
 - Public possession laws for laser pointers (including ≤ 1 mW in some contexts)

Victoria (OHS)

- No laser-specific licensing regime
- Governed by:
 - General OHS duties
 - Plant compliance code
- Laser pointers regulated as prohibited weapons (>1 mW)

Queensland (WHS)

- Radiation laws apply to **harmful non-ionising radiation**, but laser-specific regulation is limited to:
 - **Medical/cosmetic lasers**
- Laser pointers regulated with “reasonable excuse” provisions

South Australia (WHS)

- No confirmed industrial laser-specific radiation regime in accessible materials
- General WHS duties apply

Western Australia (WHS + Radiation)

- Most prescriptive regime in Australia
- Requires:
 - Licensing (users and activities)
 - Registration (Class 3B and 4)
 - Compliance with mandated standards
 - Specific engineered controls (Schedule XIV)

Tasmania (WHS + Radiation)

- Broad radiation definition captures all industrial lasers
- Requires:
 - Licence to deal with laser
 - Registration of premises
- Performance-based controls tied to licence conditions

ACT (WHS)

- No industrial laser-specific licensing
- Laser pointers regulated as prohibited weapons

Northern Territory (WHS)

- No industrial laser-specific licensing
- Laser pointers regulated under weapons laws

Commonwealth

- Applies WHS framework to:
 - Commonwealth entities
 - Controlled persons
- **ARPANS Act** applies to:
 - Controlled radiation sources
- Licensing required for “controlled lasers”

Detailed Notes on Regulatory Interpretation

WHS Clause 223 (Critical)

Across harmonised jurisdictions:

- **Class 3B and Class 4 lasers are effectively prohibited in construction work**
 - This is a major compliance constraint for:
 - On-site welding
 - Field cleaning operations
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ARPANSA's Role

- ARPANSA:
 - **Does not regulate state-based industrial laser use**
 - Provides **guidance only**, except for Commonwealth-controlled entities
- Their references to 60825 standards:
 - Are widely adopted as best practice
 - But are **not automatically enforceable law in states**

Standards Application

- **60825.1** → product compliance (manufacturer responsibility)
- **60825.14** → operational safety (user responsibility)

For practical compliance, **Part 14 is the critical reference.**

Weapon Law Overlap (Important Emerging Risk)

Certain handheld laser devices may:

- Fall under **weapon legislation**, not just WHS
- Be captured if:
 - Battery-operated
 - Portable
 - Capable of misuse as a directed beam device

This is particularly relevant for:

- Handheld laser cleaners
- Portable systems without enclosure

Practical Compliance Guidance

Compliance should be approached as a **system design problem**, not documentation.

1. Confirm Laser Classification and Use Case

- Most industrial systems = **Class 4**
- Drives:
 - Engineering controls
 - Regulatory exposure

2. Identify Jurisdictional Overlays

- WA → licensing + prescriptive controls
 - TAS → licensing + registered premises
 - All WHS states → Clause 223 restrictions (construction)
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3. Design Engineering Controls First

Typical requirements:

- Full or partial enclosure
 - Interlocked access
 - Beam stops/attenuation
 - Controlled access zones
 - Administrative controls layered after engineering
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4. Account for Process-Specific Hazards

- **Laser welding:**
 - Radiation
 - Fumes
 - Fire risk
 - **Laser cleaning:**
 - Airborne contaminants (primary issue)
 - Often requires stronger extraction systems than welding
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5. Check Non-Obvious Regulatory Triggers

- Weapon laws (handheld systems)
 - Radiation licensing (WA, TAS)
 - Construction prohibitions (all WHS jurisdictions)
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Conclusion

Across Australia, laser welding and laser cleaning are regulated primarily as **high-risk plant activities involving optical radiation**, governed by:

- WHS/OHS risk management frameworks
- The requirement to eliminate or minimise risk **so far as reasonably practicable**

However:

- **Western Australia and Tasmania impose additional radiation licensing regimes**
- **All WHS jurisdictions restrict Class 3B and 4 laser use in construction**
- **Weapon laws may apply to handheld devices**

Standards such as **AS/NZS IEC 60825.1 and 60825.14** provide the technical framework for safe operation, but:

- They are **guidance tools**, not universal legal requirements
- Their enforceability depends on how they are adopted within each jurisdiction