

Product Safety Assessment: LZRTECT Laser Welding Screen

1.0 Purpose

This document provides a detailed assessment of the Shaver Industries LZRTECT Laser Welding Screen. Its purpose is to explain how the product's certified performance makes it a suitable engineering control for high-power laser applications by assessing it against the relevant local standard, **AS/NZS IEC 60825.4:2023**. This assessment is based on the official documentation provided by the manufacturer, including independent test certificates and declarations of conformity.

2.0 Understanding Laser Safety Classifications (Based on EN 60825-1:2014)

To select the correct safety equipment, it's essential to understand that laser systems are categorized into safety classes based on their potential to cause injury. The standard **EN 60825-1:2014** (*Safety of laser products*) defines this classification system. For industrial applications like laser welding, the key distinction is between Class 3B and Class 4.

- **Class 3B Lasers:** The primary hazard is from direct viewing of the beam or a mirror-like (specular) reflection. Critically, the standard notes that viewing a scattered, diffuse reflection from a dull surface is **normally safe**. The risk of skin injury or fire is low unless the beam is tightly focused.
- **Class 4 Lasers:** This is the highest classification. In addition to the direct beam being hazardous, the key distinction is that even a **diffuse reflection may be hazardous** to the eyes and skin. Furthermore, Class 4 lasers are powerful enough to represent a significant **fire hazard**.

The need for a robust physical barrier, such as a laser curtain, is driven by the requirement to manage the unique dangers of a **Class 4 laser environment**, where even stray, scattered light must be contained, as mandated by standards like AS/NZS IEC 60825.4:2023.

3.0 LZRTECT Certified Performance

The LZRTECT laser curtain has been independently tested and certified to withstand direct laser impact at high power densities. This performance data is crucial for assessing the product's suitability against the requirements of **AS/NZS IEC 60825.4:2023**.

3.1 European Certification (EN 12254)

- Shaver Industries has issued a formal **EC Declaration of Conformity**, stating the LWS9000/LWS11000 product complies with relevant European directives.
- This declaration is supported by testing from Spica Technologies, certifying that the curtain material meets the requirements of **EN 12254:2010**, a standard specifically for laser workplace screens.
- The testing confirms the material achieves a protection level of **AB5**, which is equivalent to withstanding a direct laser impact of **250 W/cm²** for 5 seconds without penetration.

3.2 North American Certification (ANSI Z136.7)

- The barrier material has also been tested according to the American standard **ANSI Z136.7-2020**, which provides a testing protocol for laser barriers.
- This certification confirms the material withstood a laser irradiance of **60 W/cm² for a full 100 seconds with no penetration**, demonstrating its durability over prolonged exposure.

4.0 User Responsibility: Risk Assessment for Compliance

The standard **AS/NZS IEC 60825.4:2023** is based on a risk-management approach. This means that while the manufacturer provides certified performance data for the product, the end-user has the ultimate responsibility for ensuring the equipment is appropriate for their specific application.

To comply with the standard, a user must:

1. **Conduct a Risk Assessment:** Evaluate their specific laser setup to determine the potential laser radiation hazards.
2. **Determine the Required Protection Level:** Based on the risk assessment, calculate the required Protective Exposure Limit (PEL) for any protective barriers. This calculation will be based on the laser's power, wavelength, beam characteristics, and reasonably foreseeable fault conditions.
3. **Verify Product Performance:** Compare the required PEL from the risk assessment against the manufacturer's certified performance data (e.g., the 250 W/cm² rating).

Compliance is achieved when the certified performance of the LZRECT curtain meets or exceeds the protection level required by the user's specific risk assessment. The certificates provided by the manufacturer serve as the evidence of the product's performance capabilities for this verification process.

5.0 Conclusion

The independent testing and certification of the LZRECT Laser Welding Screen confirm its ability to withstand high-power laser radiation. Its certified performance rating makes it a suitable engineering control for managing the hazards of **Class 4 laser systems**. Final compliance for a specific installation in Auckland is achieved when the end-user's own risk assessment, conducted in accordance with **AS/NZS IEC 60825.4:2023**, confirms that the curtain's certified protection level is sufficient for the application.

References

European Committee for Electrotechnical Standardization. (2014). *EN 60825-1:2014: Safety of laser products - Part 1: Equipment classification and requirements*. Brussels, Belgium: CENELEC.

Shaver Industries Inc. (2024, January 25). *LZRECT EC Declaration of Conformity LWS9000-LWS11000*. Waterloo, ON: Shaver Industries Inc.

Shaver Industries Inc. (n.d.). *LzrTect - Standard Laser Safety Retractable Laser Weld Screen: Product Specification Sheet*. Waterloo, ON: Shaver Industries Inc.

Spica Technologies Inc. (2023, December 7). *Laser Optical Density Certification No. 77362*. Hollis, NH: Spica Technologies Inc.

Spica Technologies Inc. (2023, November 17). *Optical Density/Laser Resistance Certification No. 77174*. Hollis, NH: Spica Technologies Inc.

Standards New Zealand, & Standards Australia. (2023). *AS/NZS IEC 60825.4:2023: Safety of laser products - Part 4: Laser guards*. Wellington, NZ: Standards New Zealand.