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**Wind News Briefs > In War Against Wind Turbine...**

Mar 21, 2024

# In War Against Wind Turbine Corrosion, Clean Lasers Prove Very Effective

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Today, one of the easiest to use, most effective alternatives in the wind power industry's war against corrosion is the increasingly important category of industrial-grade, clean technology lasers. With this approach, precision laser-based systems are used to remove corrosion, contaminants, paint, and residues with a high-energy laser beam that leaves the substrate unaffected. Preparation and cleanup time are minimal, and the low-maintenance equipment can last decades. The technology minimizes operator exposure to potential environmental health hazards. In addition, no consumables are necessary.

**A More Effective Weapon to Eliminate Corrosion**

In the wind power industry, it is necessary to remove corrosion, residue, oil, grease, or paint before coating components or infrastructure to improve coating adhesion. Toward this end, laser-based systems have significant advantages over traditional methods, starting with ease of use.

"With laser-based systems, an operator simply points and clicks a high-energy laser beam at the surface. The substrate is not affected by the laser, and the systems do not create any mess or byproducts. The approach is eco-friendly, energy-efficient, and completes the job in approximately half the time of traditional methods when preparation and cleanup are considered. Also, no consumables are required," says Wayne Tupuola, CEO, Orlando, Florida-based **Laser Photonics**, a leading provider of patented industrial grade CleanTech lasers for cleaning and surface conditioning. The company's systems function either as mobile standalone units or can be integrated into production lines.

In the case of Laser Photonics, the laser systems are available in portable and stationary models ranging from 50 to 3,000-watts (a 4,000-watt version is in development) with chamber sizes from 3' x 3' in size to 6' x 12'. The systems can also be installed in manufacturing lines in cabinets or operated by a robotic arm.

The CleanTech lasers are used to refurbish wind turbine components and infrastructure, such as when removing a previous coating along with any corrosion to facilitate the new

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coating's adhesion to the surface. The laser pre-treatment of metal surfaces can also be used to streamline various manufacturing processes by removing any rust from components.

Another common laser application involves pre-weld treatment to remove corrosion, mill scale, residue, and any impurities on the surface of the base material that would compromise the weld's effectiveness. It is essential to avoid any such contamination on a weld's surface, which could otherwise lead to a weakening of the weld's mechanical properties, requiring rework.

Laser treatment is also used for post-weld cleaning to increase the life expectancy and corrosion resistance of a welded joint.

Post-weld cleaning is important for stainless steel as well. The strength of stainless steel allows wind turbines to be built taller and more efficiently while providing corrosion resistance. However, welding can cause a "heat tint," a discolored, thickened top layer on the stainless steel around the weld bead within the heat affected zone that compromises corrosion resistance. Removing the heat tinted top layer is necessary to restore stainless steel's full corrosion resistance.

*For more information on laser cleaning solutions for surface preparation, contact Laser Photonics at (407) 804-1000 or visit their website.*

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