



CLEANTECH

About Laser Photonics	1
Industries We Serve	3
Dangers of Alternative Methods	5
Product Overview	8
Next Generation Features	20
Coating Strip Rate Equation	21
Applications	25

Professionals in the aerospace, defense, automotive, manufacturing, and maritime sectors have called for cleaning methods that are both effective and environmentally friendly. Laser Photonics has risen to the challenge, delivering the perfect solution with its CleanTech line of laser blasting systems.

Fortune 500 companies across the United States trust Laser Photonics to provide innovative and safe technology that meets their needs. We deliver industrial laser solutions that not only help enterprises comply with regulatory guidance on worker and environmental safety but also offer technology that is easy to use, energy-efficient, quiet, and cost-effective, which translates to an excellent ROI.



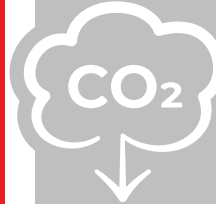
About Laser Photonics



Over 40 years of industry experience



Automate your industrial processes with robotic laser technology to improve safety and productivity



Paired with a fume extractor, laser cleaning produces no harmful emissions or hazardous secondary waste

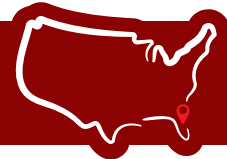


Leading the way in innovation



Serving Fortune 500 companies

U.S.-based support



Our approach to sustainability is integrated into our business operations; we strive to make a positive impact on the world while delivering value to our stakeholders





In-house research and development



Companies investing in laser cleaning can achieve an ROI in as little as **two years** thanks to significant cost savings and increased productivity

No hazardous chemicals, abrasives, complex cleanup, or waste disposal



LPC is committed to providing impeccable customer service and ensuring that our clients are satisfied with our products

Precision laser technology allows users to minimize waste generation, leading to long-term cost savings

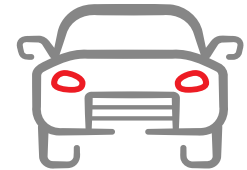
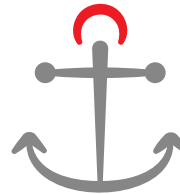
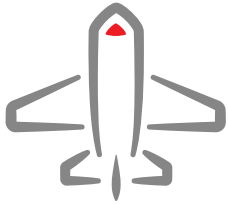


Our catalog features a broad selection of laser products ranging in power and functionality



Custom solutions for any application

Industries We Serve



Aerospace

Flawless maintenance and assembly of components for aircraft integrity

Defense

On-the-go equipment marking and decontamination for critical missions

Maritime

Corrosion control at sea and ashore for smooth sailing

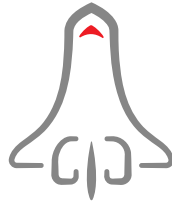
Automotive

Vehicle manufacturing and customization taken to the next level



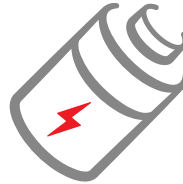
Nuclear

Effective removal of radioactive contamination at nuclear facilities



Space

Specialized tools for part marking in hard-to-reach areas



Battery

Eco-friendly technology for sustainability-focused businesses



Energy

Decontamination in challenging environments to ensure safety

Laser Cleaning vs. Alternative Methods

Cleaning Method	Lasers	Chemical	Dry Ice	Mechanical	Sandblasting
Precision					
Cleaning Efficiency					
Consumables	Electricity	Chemicals	Dry ice pellets, electricity	Sandpaper, grinding wheels, electricity	Abrasive blasting media, electricity
Cleaning Effect					
Damage					
Safety & Environmental Protection					
Manual Operation	Easy operation, handheld or automatic	Complicated operation, high safety requirements for workers, pollution protection measures needed	Easy operation, handheld or automatic	Labor intensive, pollution protection measures needed	Labor intensive, pollution protection measures needed
Cost Input	Higher initial cost, no consumables, very low maintenance cost	Low initial cost, very high consumables cost	Medium initial cost, high consumables cost	High initial cost, high consumable and labor costs	High initial cost, high consumable and labor costs

Dangers of Alternative Methods



Sandblasting

carries the potential for health hazards, environmental harm, and considerable costs associated with blasting media



Chemical Cleaning

emits harmful VOCs, posing a risk to operator health and the environment; this method can also cause skin burns upon contact



Mechanical Cleaning

is a time-consuming, labor-intensive process that can cause damage to worked-on components due to physical abrasion



Dry Ice Blasting

requires specialized equipment for storage and cleaning, which leaves users susceptible to high costs and an increased likelihood of complications



CLEANTECH
LASER SYSTEMS

LASER
CLEAN ROOM

CLEANTECH

CLEANTECH
LASER SYSTEMS

FIBER LASER
LASER
CLEANTECH

CLEANTECH

LASER
PHOTONICS
NEXT GENERATION LASER SYSTEMS

Handheld Laser Cleaning & Surface Preparation System

Laser Photonics offers a variety of laser cleaning and surface preparation systems tailored for specific applications. Our laser systems are categorized into one of three material processing classes: finishing, roughening, and conditioning. Each system comes with adjustable settings and a variety of laser ablation patterns, allowing users to configure the technology to deliver the results they need.

- » A **finishing** system is designed with a low-power pulsed laser that, in addition to contaminant and corrosion removal, is effective at creating a polished finish on targeted material.
- » A **roughening** system is equipped with an adjustable, powerful continuous-wave laser. These lasers are particularly effective at industrial cleaning while also being ideal for texturing a surface to improve its adhesive properties.
- » A **conditioning** system contains a high-power pulsed laser and combines the speed of our roughening lasers with finishing capabilities.



Finishing Laser

A finishing laser is a fiber laser system with a low power output. Compact and air-cooled, this system excels at small-scale cleaning tasks and is easily transportable. When set to certain parameters, a finishing laser system can polish a surface through controlled micro-melting and re-solidifying of the material.



Material Processing Class
Finishing Example



Material Processing Class

Finishing laser systems are used to reduce the roughness of metals and other materials. When set to specific parameters, a laser beam can melt the surface of a workpiece or component without damaging its microstructure. The resulting melt pool re-solidifies quickly, leaving a polished finish and increased tensile strength. Laser Photonics offers a selection of finishing-class pulsed laser systems where pulse frequency and duration can be adjusted based on the material being processed.



Finishing



Roughening Laser

Roughening lasers are fiber laser systems with a high power output. These are ideal for handling large-scale cleaning jobs at a fast pace and offer a truly satisfying experience. At a higher power setting, a roughening laser can texturize and “roughen” the surface of the target material for further processing, such as coverage with a coating that requires strong adhesion.



Material Processing Class
Roughening Example



Material Processing Class

During laser roughening, a precise high-powered laser beam ablates a targeted surface, vaporizing contaminants and altering a controlled portion of the material without damaging the substrate, leaving a coarse or textured finish. Roughening is often used to prime a surface and improve its adhesive properties before subsequent treatment, like the application of a coating or sealant.

Our roughening lasers are continuous wave (CW) lasers that provide a continuous light source of a singular wavelength, which is essential for precise and consistent surface treatment. At a high power setting, a CW laser can roughen a surface, while at a low power setting with extended exposure, it can form a melt pool and yield a polished surface. For certain roughening or other specific applications, our CW lasers can be set to a “Modulated” mode for a pulse-like laser release.



Roughening



Conditioning Laser

A conditioning laser system combines the functionalities of both roughening and finishing. Its power output range allows it to reach up to the level required for roughening, and the settings can be adjusted to achieve a finishing function. This system's cleaning rate exceeds that of a finishing laser, and it is capable of taking on larger scale tasks



Material Processing Class
Conditioning Example

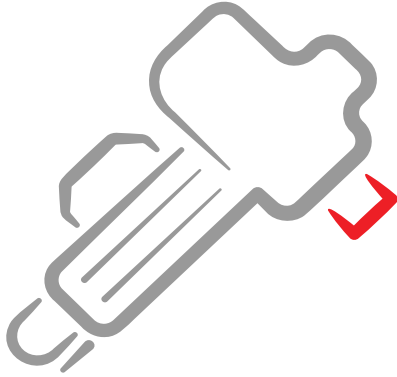


Material Processing Class

A conditioning laser system contains a powerful pulsed laser that makes it a remarkably versatile tool. At a higher power, it can coarsen or texturize a targeted surface, which is often needed for priming a surface and improving its adhesive properties. With adjusted parameters, the laser system can be used to melt the micro-surface of the material to reduce its defects and yield a polished finish. Both roughening and finishing can be achieved with very little change to the underlying substrate.

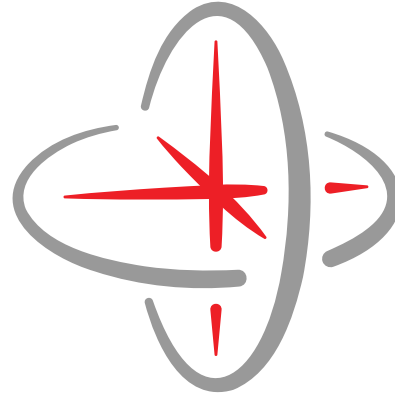


Conditioning



Handheld

Our handheld laser system features a head unit that is connected to the main machine via a cable. The machine is mobile and can be brought directly to any job site.





Dual Axis

Dual axis technology forms a two-dimensional laser pattern that is configurable to various surfaces. This allows our dual axis laser systems to clean quicker and handle complex shapes and uneven surfaces better than single axis lasers.

Single Axis vs. Dual Axis

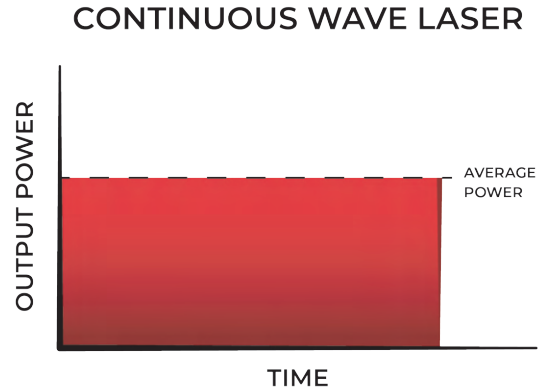
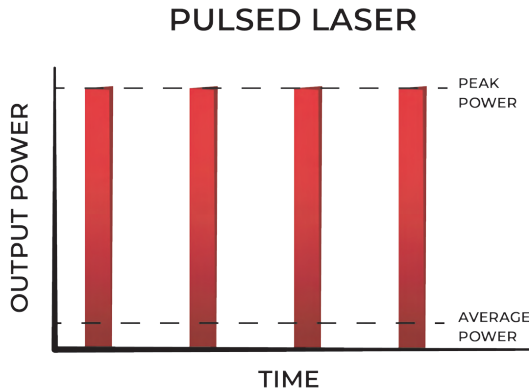
A laser's scanhead is built with either dual axis or single axis capability. Single axis lasers emit light forming a line pattern in one dimension whereas dual axis technology forms a laser pattern along two planes. While Laser Photonics offers both dual and single axis laser products, our flagship CleanTech systems integrate advanced dual axis technology. These lasers are more efficient at processing complex surfaces with uneven and textured quality, offering improved processing speed and accuracy, as well as a variety of ablation pattern presets with customization options.

SINGLE AXIS	VS	DUAL AXIS
		
Straight line optic pattern		Box-shaped optic pattern
Best suited for cleaning flat surfaces		Best suited for cleaning complex surfaces
Quick and efficient on small projects		Can be adapted to fit any project



Pulsed vs. Continuous Wave

A continuous wave (CW) laser emits light continuously at a constant power level with a maximum energy of up to 3 kilowatts, depending on your system build. A pulsed laser, in contrast, emits short pulses of light with the energy being accumulated in a set timeframe. Therefore, the peak power of a pulse can reach a value much greater than the average power output of a system. When using our CW lasers, operators can set the system to a “Modulated” mode to achieve a pulsed-like laser release during certain roughening applications.



CleanTech User Interface

Control your CleanTech system via a user-friendly touchscreen GUI. Choose from our pattern presets or develop a custom pattern for specialized tasks.

» **How many patterns are there and what are they?**

The system offers five modes with laser patterns of varying sizes and shapes. The size goes up to 4 x 4 inches and the power output can be set to as low as 10%.

» **How do you determine which pattern to set?**

Choose an ablation pattern based on the composition and size of the target. For example, a pattern measuring 1 square inch suits cleaning areas as small as a quarter. A pattern measuring 1/8 x 4 inches is better suited for cleaning a large area. When working on thin material, adjust the parameters to avoid unwanted melting and warping.



Next-Generation Laser Features



Overheat Protection

Our next-gen laser systems are equipped with a temperature sensor inside the scanhead to protect the machinery from overheating. Should the internal temperature rise above a certain limit, the laser will not activate, minimizing damage to the equipment.



Mobile Connectivity

The Laser Photonics smartphone app allows users to change laser modes remotely. Different modes adjust the laser system's power and ablation pattern. Operators can now conveniently modify system settings while operating the laser scanhead at a distance from the main unit.



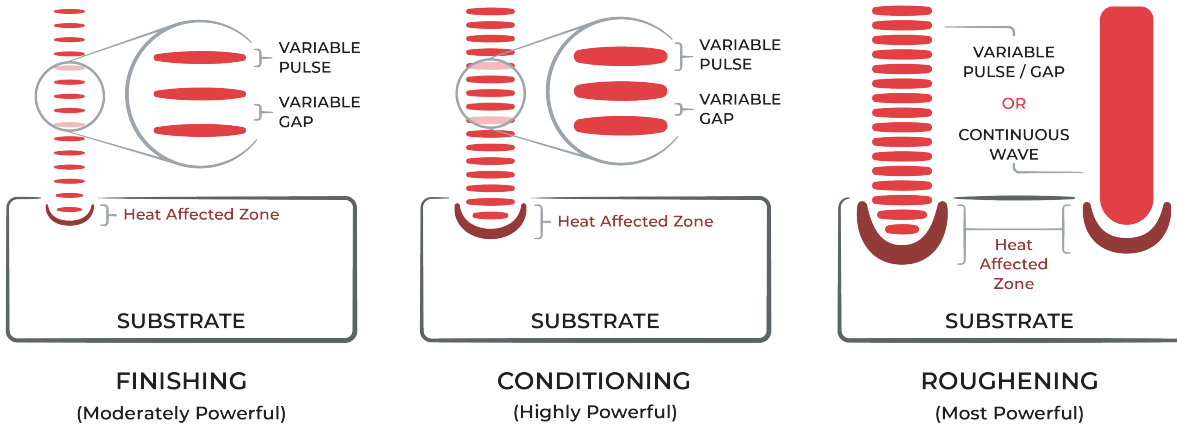
Compact Scanhead

For enhanced portability and control of the handheld laser, we have improved its size and weight. Its upgraded small form factor allows for greater precision, seamless operator mobility, and easy integration into various robotic automation systems.



Variable Energy Pulse

A laser pulse can be modified to suit a variety of applications. The adjustable laser parameters include power, frequency, and duration, while the pattern can be changed in size and shape. These settings allow the operator to fine-tune the process and achieve the needed depth and speed that are optimal during ablation.



Safety Features

Our CleanTech laser cleaning systems offer a non-abrasive cleaning process that is safe, easy to use, and more eco-friendly than traditional abrasive cleaning methods such as sandblasting. Our technology minimizes the need for chemicals and abrasives in industrial settings, helping companies comply with increasingly strict regulatory guidance from organizations like OSHA and the EPA.



No Dangerous Chemicals



No Complex Cleanup



No Costly Abrasives

Coating Strip Rate Equation

The approximate strip rate in square feet per hour is calculated as follows:

$$\text{Coating Strip Rate} \left(\frac{\text{ft}^2}{\text{hr}} \right) = 2 \times \frac{\text{laser power in kW}}{\text{coating thickness in mils}^*} \times 60 \text{ minutes}$$

*1 mil = 0.001 inch

MATERIAL PROCESSING CLASS	ROUGHENING LASERS			CONDITIONING LASERS		FINISHING LASERS		
Laser Cleaning Device	CTIR-3050	CTIR-3040	CTCR-3010	CTIC-2020	CTIC-2010	CTCF-1030	CTCF-1020	CTCF-1010
Estimated Strip Rate in ft ² /hr	360	240	120	60	36	24	12	6

Laser Blaster Matching Chart

SPECIFICATIONS AND COMPARISONS	ROUGHENING LASERS			CONDITIONING LASERS		FINISHING LASERS		
	CTIR-3050	CTIR-3040	CTCR-3010	CTIC-2020	CTIC-2010	CTCF-1030	CTCF-1020	CTCF-1010
CAMI (Media Abrasive Blasting)	24	30	40	70	80	100	150	200
Grit (Sandpaper)	#40	#60	#80	#180	#220	#320	#600	#2000
Dots Per Inch Resolution (DPI)	72-150			200-300		600-1200		
Lines Per Inch Resolution (LPI)	35-65			85-120		133-200		
Ideal Sheet Metal Gauge	1/4" - 3" Plate	4g - 10g Sheet		11g - 19g Sheet		20g - 30g Sheet		

CleanTech conditioning laser systems present the most **cost-effective, time-efficient, and safe** surface treatment solution for a diverse set of applications.

Applications

- » Surface Conditioning
- » Industrial Cleaning
- » Coating Removal
- » Surface Texturing
- » Surface Finishing
- » Pre-Adhesion Treatment
- » Pre-Weld Preparation
- » Post-Weld Treatment
- » Degreasing
- » Surface Preparation
- » Corrosion Removal
- » Zinc Coating Removal
- » Anodized Coating Removal
- » Oxide Removal
- » Injection Mold Cleaning

Materials

- » Steel
- » Ceramic
- » Aluminum
- » Brass
- » Titanium
- » Copper
- » Concrete
- » CFRP
- » Plastic
- » Silicon
- » Metal Alloys
- » Cast Iron
- » Carbide
- » Chrome
- » Galvanized Metals

Customer Experience Center

Bring or ship a sample to Laser Photonics' Customer Experience Center in Orlando, Florida, and see firsthand how our technology can benefit your business. Experience our newest laser-powered technology, talk in person with our tech experts, and get all your questions answered by our pros.



Corrosion Removal on Steel Housing



Rust Removal on Steel Cylinder



Corrosion Removal on Aluminum Mold

Contact Us To Process Your Sample

Schedule a call with our team of experts to learn more about Laser Photonics technology and book an appointment at our Customer Experience Center in Orlando, Florida. Connect with us today and explore our next-generation laser systems to select the solutions that best suit your needs.



« Schedule a Call



CTIC-2020

CTIC-2010

CLEANTECH

THINKING GENERATIONS AHEAD



Safe



Easy To Use



Efficient



Eco-Friendly

Laser Code Compliance



Laser Photonics provides custom-built solutions in addition to its available products and offers quotes upon request. For assistance in determining which laser solution will best suit your needs, contact Laser Photonics or visit our website at www.laserphotonics.com



1064 nm wavelength laser light emitted from this laser system is invisible and harmful to the human eye. Proper laser safety eyewear must be worn during operation.



21 CFR 1040.10 Compliance

This OEM product is a Class IV laser as designated by the CDRH and does not meet the full requirements as a stand-alone laser system as defined by 21 CFR 1040.10 under the Radiation Control for Health and Safety Act of 1968. It is user responsibility to utilize all integrated safety features of the system to exploit as compliant with 21 CFR 1040.10.

Important notice: all specifications, technical data and other information contained in this document, and all statements about the product(s) identified in this document, are preliminary in nature and are provided "as is," without warranty or assurance of any kind. Laser Photonics makes no representation or warranty, express or implied, regarding the product(s) or their specifications. All information is subject to change. Please contact Laser Photonics for more information. Laser Photonics and the Laser Photonics logo are trademarks of Laser Photonics Corporation. Other trademarks are the property of their respective owners. © Laser Photonics Corporation. All rights reserved.

 407.804.1000

 laserphotonics.com

 NASDAQ: LASE

VERSION 2.0

