

# CleanTech™ LASER

LASER SURFACE PREPARATION AND CLEANING SYSTEM



CLASS 1 INDUSTRIAL-GRADE LASER PARTS CLEANING,  
RUST REMOVAL AND SURFACE CONDITIONING SYSTEM  
WITH UP TO 36" X 36" OF THE WORKING ENVELOPE.



CleanTech™  
**MEGACENTER**

## Industries

- Defense
- Government
- Aerospace
- Automotive
- Metal Fabrication
- Direct Parts Marking
- Molding
- & Many More!

## CleanTech™ Laser Surface Preparation and Cleaning System

The CleanTech™ Megacenter is a high performance, industrial-grade, fast, precise and incredibly productive laser cleaning machine. The CleanTech Megacenter is the only laser cleaning machine in the world that incorporates the exclusive Zero-Friction Direct Drive Motion System™, powerful fiber lasers, Flexion Technology™ and 36" x 36" working surface - for speed, precision and flexibility.

The CleanTech™ Megacenter laser cleaning equipment removes the messy chemicals and contaminants from the equation. No more storing and using dangerous chemicals, hazardous fumes, costly clean-up and complicated procedures. Simply close the Class 1 safety doors and press a button. The parts are automatically cleaned and the surface is ready. CleanTech is the most cost effective, efficient and safe method of industrial cleaning, rust removal, paint removal and surface preparation.

CleanTech Laser cleaning machines meet the full FDA requirements as a class 1 laser product and include added safety measures for easy and safe operation in all industries and work environments. Aerospace, defense, commercial, manufacturing and institutional industries are pressing for economical, efficient and Earth friendly cleaning processes. The CleanTech Megacenter provides a versatile and easy to use industrial-grade laser cleaning machine that is eco-friendly, renewable and budget friendly.



## APPLICATIONS

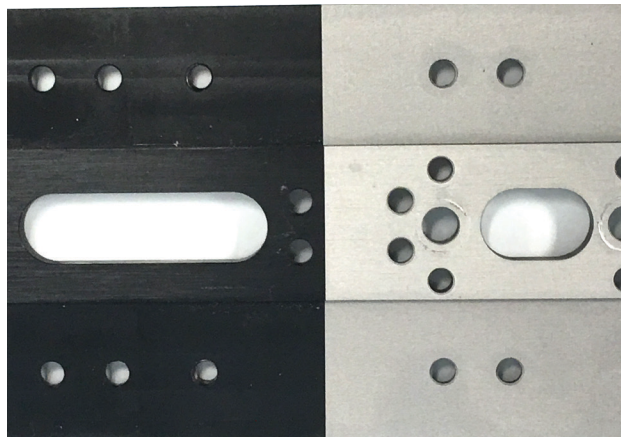
### The CleanTech™ Laser Cleaning System

Applications and Types of Cleaning		Material / Product Suitability	
<ul style="list-style-type: none"> <li>• De-painting</li> <li>• Surface Cleaning</li> <li>• Surface Treatment</li> <li>• Induced Surface Improvement</li> <li>• Uniform Surface with low HAZ</li> <li>• Paint Removal</li> <li>• Subtractive Surface Treatment</li> <li>• Surface Texturing</li> <li>• Cosmetic Surface Conditioning (replaces bead blasting)</li> </ul>	<ul style="list-style-type: none"> <li>• Selective Paint Removal</li> <li>• Mold Cleaning</li> <li>• Parts Cleaning</li> <li>• Anodizing Removal</li> <li>• 3D Surface Cleaning and Conditioning</li> <li>• Laser Cleaning</li> <li>• "On-The-Fly" Laser Cleaning</li> <li>• Laser Ablation</li> <li>• Paint Stripping</li> <li>• Rust and Corrosion Removal</li> <li>• Degreasing</li> </ul>	<ul style="list-style-type: none"> <li>• Aluminum</li> <li>• Stainless Steel</li> <li>• Mild Steel</li> <li>• Titanium</li> <li>• Copper</li> <li>• Brass</li> <li>• Nickel</li> <li>• CFRP (Carbon Fiber Reinforced Polymer)</li> <li>• Polypropylene</li> <li>• Painted Metal Alloys</li> <li>• Chrome</li> <li>• Cast iron</li> <li>• Coated Plastic</li> </ul>	<ul style="list-style-type: none"> <li>• Plastic</li> <li>• Rubber</li> <li>• Silicon</li> <li>• Carbide</li> <li>• PVC</li> <li>• Nylon</li> <li>• Valox</li> <li>• Glass</li> <li>• Galvanized Metals</li> <li>• Multi-Coated Materials</li> <li>• Polycarbonate</li> <li>• And More!</li> </ul>

## CleanTech™ Laser Surface Preparation and Cleaning System Features:

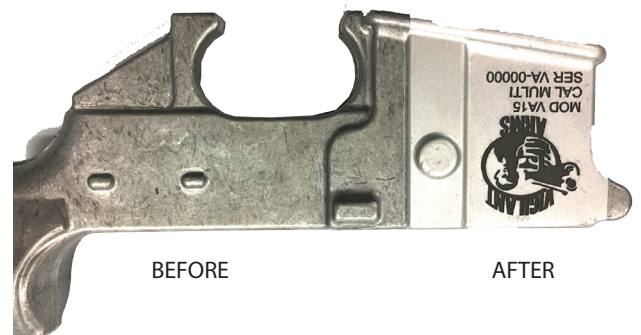
- Flexion Technology for Precise and Complete Laser Surface Cleaning
- Eliminates Wet Chemical Cleaning Process
- Safe, Fast and Eco-friendly
- Zero-Friction Direct Drive Motion System
- 36" x 36" cleaning area
- Long-term industrial-grade reliability with 100,000 hours MTBF
- Low Energy Consumption
- Laser "ON" magnetically locked front doors for operator safety
- Certified Class 1 Laser Enclosure
- PC-Based Controller, Flat Panel Monitor, Mouse and Keyboard
- Industrial-Grade Extruded Frame with 19" Rack Mount Design
- Exhaust Outlet for Fume Extractor
- Operating Temp +18C to +25C: Relative Humidity (40-80%) non-condensing
- High throughput with a palette loading/unloading table (Optional)
- 80 PSI Pneumatically Activated side sliding doors (Optional)
- Inert gas handling and selection system (up to 3 types of gas) for high quality surface conditioning and treatment.
- Red diode pointer for easy job setup
- 3D Dynamic Focusing System (optional)

### Application Samples:



BEFORE

AFTER



BEFORE

AFTER



BEFORE

AFTER



BEFORE

AFTER

## Laser:

Laser was specifically designed for maintenance-free OEM applications. It delivers a diffraction limited ( $M2 < 1.05$ ) laser beam directly to the worksite via a metal sheathed single-mode fiber cable. These compact service-free Lasers are designed to operate under high shock, vibration and dust conditions in relatively high humidity across wide operating temperature ranges. Wall-plug efficiencies up to 50% result in a compact size, reduced utilities, and trouble-free air cooling. There is no routine replacement of parts or materials scheduling; they require only a low voltage power source. System can be equipped with the following laser sources:



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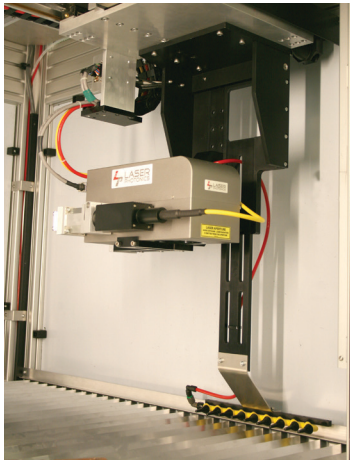
- 1mJ at 20 kHz - (2D cleaning head option)
- 1mJ at 50 kHz - (2D or 3D cleaning head option)
- 2mJ at 50 kHz - (3D cleaning head option)

## Cleaning Head:

The Cleaning Head is designed to quickly and precisely deflect and position laser beams with peak powers up to the 10th of kilowatt range. With selection of standard patterns and ability to create custom size laser cleaning beam, it makes the system extremely versatile and flexible for parts cleaning and surface structuring for large range of parts, materials and shapes. Very stable operating conditions as well as high long-term stability are provided by air cooling of the entrance aperture, electronics, and galvanometer scanners supplemented by air cooling of the deflection mirrors. The compact housing is dust proof and water spray resistant.

## 3D Dynamic Focusing System Option

The 3D Dynamic Focusing System has all the components of the laser (3D scanner, optics and controllers) in a compact design and is offered as a premium upgrade to the standard programmable Z Axis configuration.



The 3D Dynamic Focusing System (3DDFS) removes the operator from the critical and time consuming step of focusing the laser allowing for 25% faster material processing with higher precision and repeatability.

3D Dynamic Focusing allows the laser machine to dynamically detect the shape and distance of the part, then focus the beam automatically and not rely on manual positioning, mechanical movement or operator programming. Without operator input and mechanical moving parts, the 3D Dynamic Focusing System increases reliability, stability, accurate positioning and ultra-fast processing speeds



*Megacenter shown with OPTIONAL 3D Dynamic Focusing System and air assist system for more precise cleaning.*

## CleanTech™ Laser User Interface

The user-friendly software interface entails a fully integrated driver, remote diagnostic capabilities for worldwide support and multiple hardware interfaces for the ability to execute any Fonon or Laser Photonics laser Cleaning system. It allows the choice any of preinstalled cleaning patterns or develop a custom pattern for a specific job, surface specification or throughput requirements. File links to several internal databases make the CleanTech™ program flexible and powerful. Exceptional High Long-Term Reliability (50,000 MTBF)  
No water cooling required | 2-year Warranty

### Frame Design:

Rigid, light aluminum extrusion provides excellent protection of equipment corners and a stiff design for long term stability.

### Skins Design:

New modern 3 layer laminate: Aluminum, plastic, aluminum. Powder coated for industrial durability providing excellent protection for laser radiation according to CDRH requirements.

### Transparent Protective Window:

CDRH rated yellow transparent laser rated acrylic window for visualization of lasing processes and easier alignment.

### Operations & Maintenance Manual

(in English) includes:

- » Service information
- » General description
- » Laser safety manual
- » Software manual (Appendix B)
- » Operation description
- » Troubleshoot guide
- » Warranty certificate



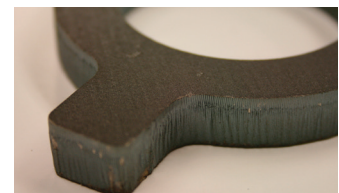
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BEFORE

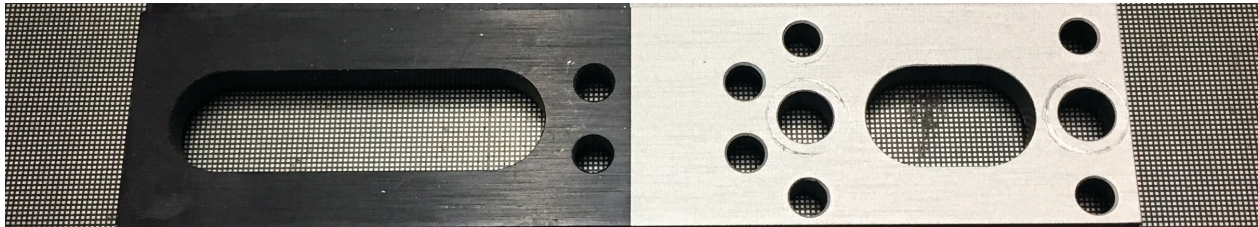


AFTER

## CleanTech Equipment & Facility Specifications

CleanTech™ Equipment & Facility Specifications	
Maximum Parts Size	Miniature Sub mm to 36" x 36" x 4"
Laser Equipment	Customer selected depending on required throughput, material, and application. For a proper selection please consult with our Application Engineering Department.
Mode of operation	Pulsed Laser (see laser selection paragraph)
Programmable Z-Axis	4" Travel (for 2D Cleaning Head Only)
Inverted XY System	24" x 24" travel
Cleaning area Standard	26" x 28" with 2D Cleaning Head
Cleaning Area Extended*	36" x 36" with 3D Cleaning Head System
System Dimensions	See envelope drawings below
Weight	375 pounds
Operating Temperature	+18 to +25o C
Relative Humidity	40 – 80% non-condensing
Electrical Requirements	120 volt 8 amps
Clean Dry Air* (If Required and equipped)**	80 PSI
Process Assist Inert gas Selection***	Nitrogen, Argon, Carbon Dioxide, Compressed air

\* Depends on Cleaning Head Selection \*\* For System with Pneumatic Components \*\*\* For Systems with Assist Gas Process Capability

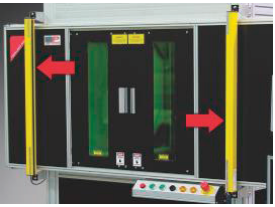
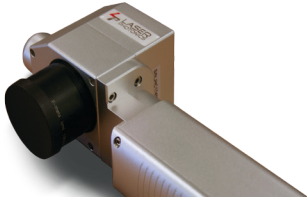

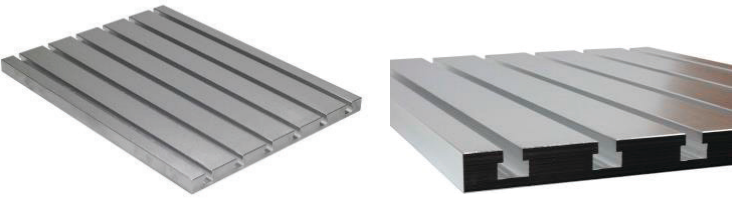



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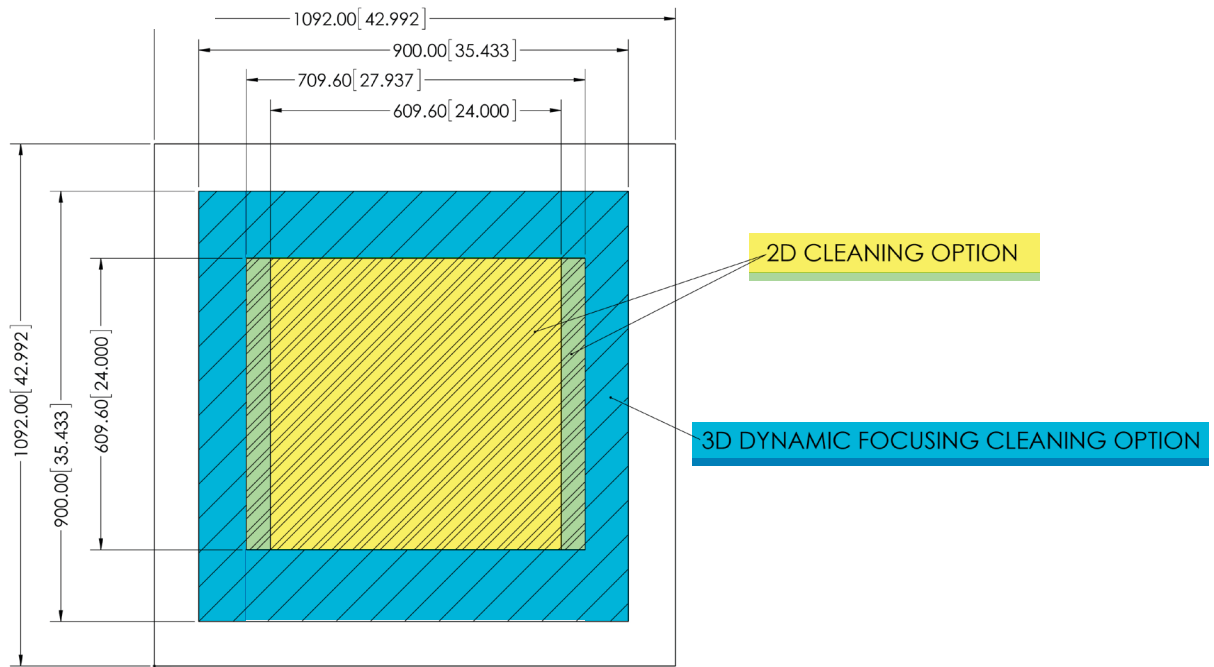
Metal Cleaning and Surface Prep for Battery Manufacturing Industry

### 3D Dynamic Focusing System Option

Options for CleanTech™ Laser System	
Light Barriers for Safe Operation	 A photograph of a laser system with two vertical yellow light barriers on either side of the main unit. Red arrows point towards the barriers, indicating their function in safety.
Optional Cleaning Heads	
2D Cleaning Head	 A close-up photograph of a 2D cleaning head, which is a rectangular metal component with a black lens on the front.
3D Cleaning Head	 A photograph of a 3D cleaning head, a more complex metal component with a yellow fiber optic cable attached to the side. It has 'LASER PHOTONICS' and 'MEGACENTER' printed on it.
Tooling Plate with T-Slots 30" x 30" x 1.5" Optional	 Two photographs of aluminum tooling plates with T-slots. The left image shows a top-down view of a single plate, and the right image shows a side view of a stack of plates.
Aluminum Slotted Table for Access Dust Collection 30" x 30" x 1.5" Optional	 Two photographs of an aluminum slotted table. The left image is a close-up of the slotted surface, and the right image shows a perspective view of the table's length.

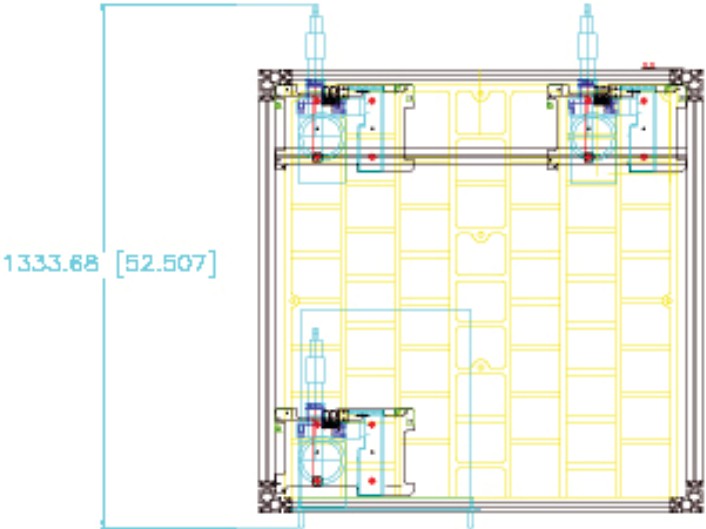
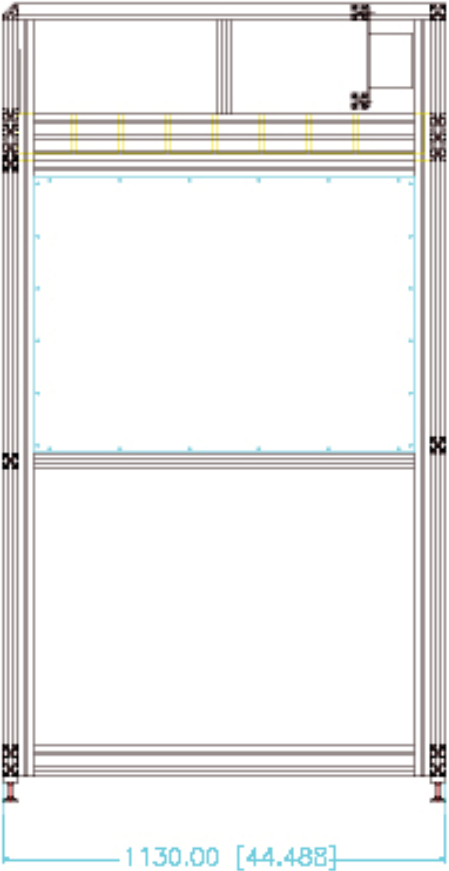
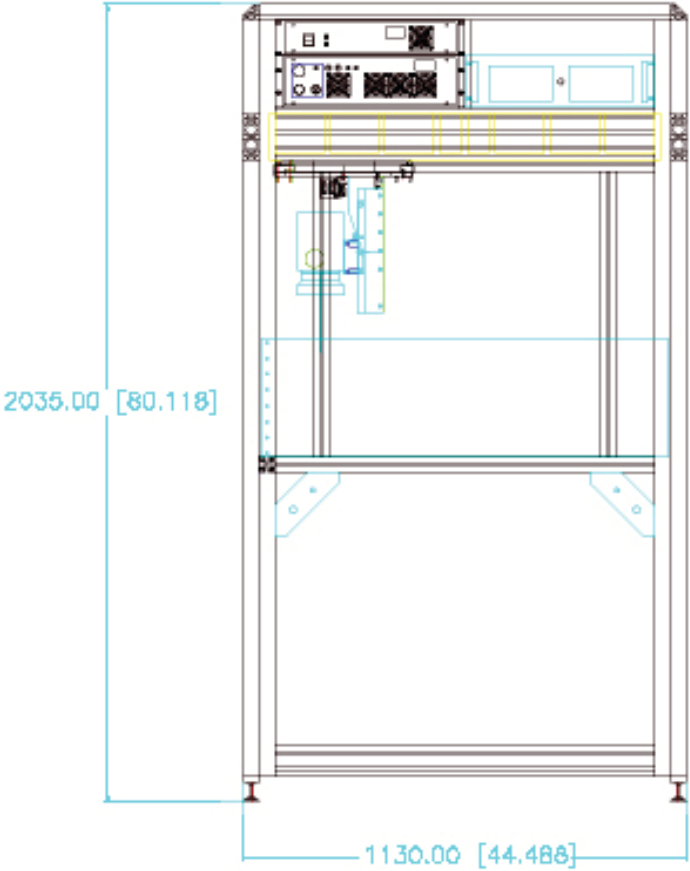
### 3D Dynamic Focusing System Option

Material Processing Envelope: 2D and 3D Dynamic Focusing Cleaning Options





**System Dimensions and Weight**  
**375 pounds**



## Application Research Center:

Laser Photonics maintains an applications lab for processing customer samples and assisting with process development. Our applications lab has the latest testing equipment to analyze all of your application needs.



## Safety Considerations During Operation

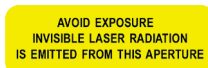


1064 nM wavelength laser light emitted from this laser system is invisible and may be harmful to the human eye. Proper laser safety eye wear must be worn during operation.

### 21 CFR 1040.10 Compliance

The product is a Class 4 laser as designated by the CDRH and meets the full requirements for a stand-alone laser system as defined by 21 CFR 1040.10 under the Radiation Control for Health and Safety Act of 1968. As an added level of security, a redundantly switched safety interlock system helps prevent accidental exposure to excess laser radiation. Plus, the system is equipped with an electrical power manual reset, a key-locked laser power switch and a remote interlock connector. Finally, the system has audible and visible emission indicators with five (5) second emission delay settings.

All these features, in combination, constitute the laser radiation safety system, which allows Laser Photonics equipment to be used in a safe and secure manner.



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