



# Automation

## *Automated Air Blast Systems*



# Position and Aim

ZERO Automation can save you time and money — our systems are the choice of production managers around the globe to meet the demand for higher, more efficient work processes and output. Managers choose ZERO Automation for jobs that call for precision and repeatability, impossible in manual operations. ZERO Automation can significantly reduce the risk of repetitive motion injuries by minimizing the operator's role in the blasting process.

Our systems will enhance your efficiencies and boost your throughput capacity, alleviating production bottlenecks. From simple nozzle oscillation to purpose-built enclosures, ZERO Automation combines proven technology with the latest parts handling and control devices. Each system is designed and built to suit our customer's application — even the paint color can be custom-specified.

While automated systems require a greater initial investment than manual cabinets, depending upon your application, your investment can quickly pay for itself in labor savings and efficiencies. With a variety of available technologies, ZERO Automation can be designed to accommodate most budgets.



The complexities of air use, blast control, media delivery, and recovery are easily handled by a PLC (*Programmable Logic Controller*) providing precise application of manufacturing processes from titanium drill bits to jet engine turbines.



ZERO Automation combines the sophistication required by the application, the desired production rate, and the budget. Our available technologies include multi-axis robotics, both for parts handling and nozzle articulation, proximity sensors, video monitors for real time visual inspection, and multi-stage cabinets to clean, then automatically finish parts in a single pass.

## Planning

Our free sample processing service helps you determine if automation is right for your operation. You supply representative parts and we process them using various parameters — media, pressure, angle, distance, part movement, blast duration. We encourage customers to visit our lab to participate in processing their parts. Following processing, we return the parts, along with a detailed report on how each was processed. Once sample processing demonstrates that blasting can produce the desired result, our sales engineers divide the process into its basic elements.

- positioning the part — create parts handling compatible with existing systems
- aiming the nozzle(s) — fixed, oscillating, or robotic-arm mounted
- managing the media — effectively recover and clean the blast media
- controlling the process — simple cycle timers, PLCs, or custom software

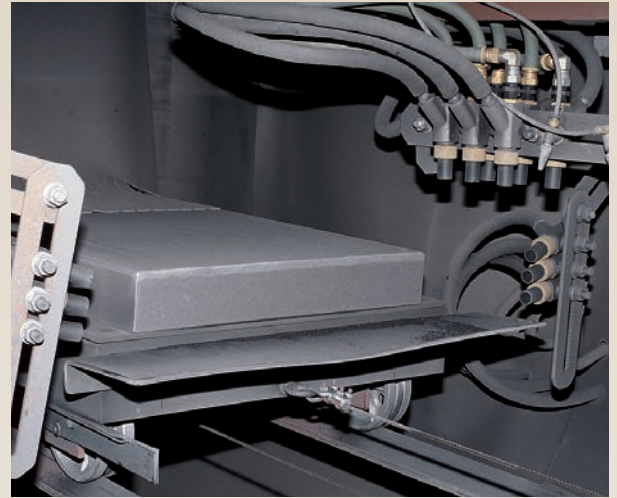
**MOTORS • FILES • FOOTBALL HELMETS • FUEL INJECTOR PARTS • FUSE HOUSINGS •  
• KNIVES • BULBS • MAILBOXES • MOLDED PLASTICS • NAIL SETS • NUCLEAR FUEL  
ERATION EQUIPMENT • ROCKET HOUSING • RUBBER BUMPERS • SHUTTERS • SAW B**

# Manage and Control

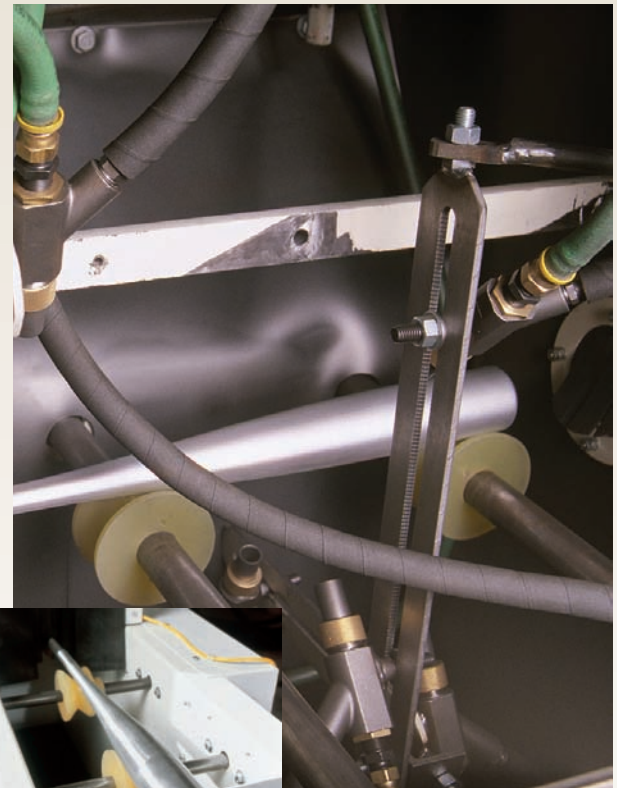
## Managing Media

To be cost effective, an automated blast system must efficiently and effectively utilize the appropriate technology to recover and clean the blast media, and return it to the blast system for re-use.

Technology	Application
Cyclone Reclaimer	Separate fine to medium mesh and lightweight media from dust and debris. Works with most media, including glass bead, aluminum oxide, and plastic.
Air-Wash Separator	Separate coarse and heavy media from dust and debris. Used with steel grit and shot. Often includes a scalping drum to screen particles by size.
Vibratory Separator/ Classifier	Screen clean media by mesh size, and remove dust and oversize particles. Used wherever operating mix is critical.
Magnetic Separator	Remove ferrous particles from non-ferrous media or remove non-ferrous particles from steel grit or shot.
Dense-Particle Separator	Remove high-density particles that could damage a delicate surface. Used with lightweight media (plastic, starch, etc.)
Media Monitoring	Includes assorted technologies, from automatic media-add sensors in hoppers to sophisticated particle-stream controls in the metering system to precisely control the volume and quality of the blast media.



*Silicon carbide media through multiple blast nozzles ensure uniform material removal from glass billets.*



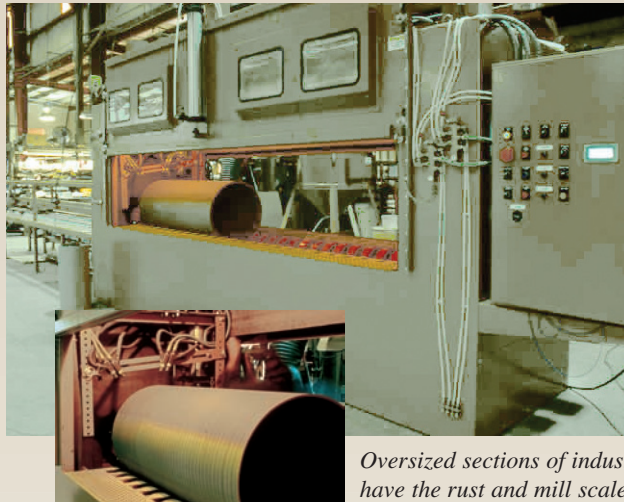
*Powered pinch roller conveyor holds and moves parts through the blast process*

GEARS • GLASSWARE • GOLF CLUBS • GUN PARTS • HEATING ELEMENTS • I BEAMS  
ROD SHIELDS • NUTS & BOLTS • PIPES • POSTAGE METERS • RADIATORS • REFRIG-  
BLADES • SPARK PLUGS • SPRINGS • STAINLESS STEEL TUBING • STAINLESS STEEL

# Automation Applications

Manufacturing & Remanufacturing  
Automobiles, Trucks and Motorcycles

Shot peen engine components, springs, calipers, and other high-stress parts to enhance fatigue strength and reduce fret cracking. Peen cylinder walls after honing to improve oil retention. Peen injector nozzles for greater strength. Clean corrosion from raw materials and rebuilt components. Clean and finish castings. Deflash plastic parts. Deburr metals and degloss plastics and composites to reduce reflective glare. Etch tracing data onto glass and metal components.



*Oversized sections of industrial pipe have the rust and mill scale removed prior to fabrication.*

Consumer Products

Prep parts for coating. Deflash plastic parts. Depaint products for rework. Blend and finish dissimilar materials. Remove tool marks from stainless steel products.



*Copier rollers are prepped for coating using aluminum oxide in a fully automated blast system.*

Aerospace

Shot peen landing gear and other high-stress components.

Aerospace and Appliance

Use lightweight non-aggressive media to remove paint or powder coatings from parts to allow corrosion control inspection or rework.

Fabrication and Machine Shops

Remove rust and mill scale from raw stock and prep weld joints.

Tube and Pipe

Clean or peen ID and OD. Deburr threaded couplings to eliminate galling and binding.

Glass and Stone

Etch designs and lettering onto surfaces. (Eliminates caustic solutions.) Mill thick glass blocks to remove residual stress. Clean glass molds to ensure consistent products.

Electronics

Etch chips, deflash circuit boards, and clean contacts.



*Parts are prepped for paint in a straight-line belt conveyor machine, which is integrated into the production line. This is a fully automated load, blast, paint and drying system.*

**AIRPLANES • ALUMINUM CASTINGS • ARTIFICIAL HIP JOINTS • BUCKLES • BLUE JEANS • BUSES • CARS • CASTINGS • CAST AUTO WHEELS • CIRCUIT BOARDS • CIRCUIT BOARD TESTERS • ROLLS • COUNTER TOPS • CRANK SHAFTS • CLUTCH DISC • CULTURED MARBLE SIMULATED**

# Special Guns, Nozzles, and More

Clemco makes an unmatched variety of nozzles, and specialty tools to cover just about any part you need to process. Wide-spray nozzles produce a larger, more uniform blast pattern. Angle nozzles, rotating nozzles and pipe blast nozzles go where conventional nozzles can't reach.



Nozzles can be easily arrayed to suit work piece processing requirements

*Sophisticated blast nozzle manipulation is achieved through the use of this articulated robotic arm*



Clemco components are fabricated to achieve optimal flexibility.



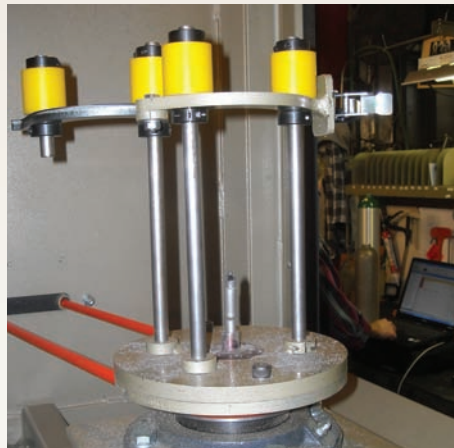
*This rotating blast nozzle array keeps reconfiguration of workpieces to a minimum by allowing 360° coverage.*

*This sophisticated blast nozzle boom maintains a precise distance as it cleans space shuttle booster rockets between missions.*



## Sound Attenuation

Depending on your requirements, our engineers can locate and muffle the air inlet and exhaust and apply sound-deadening foam to reduce noise levels outside the cabinet.



## Custom Fixturing

Clemco can provide custom fixtures for masking or holding parts that move through the cabinet.



## Alox Kits

Your investment is protected from aggressive media with rubber curtains for the cabinet, lined flex-hose for the recovery system, and rubber lining for the reclaimer.

**NS • BOAT PROPELLERS • BRAKE CALIPERS • BRAKE PADS • BRASS-WORK • BRICKS  
BREAKER BOXES • CIRCULAR SAW BLADES • CLASS RINGS • COOKWARE • COPIER  
NK TOPS • CYLINDER HEADS • DIES • DOORKNOBS • DRILL HEADS • ELECTRIC**

# Parts Handling Tailored to the Application



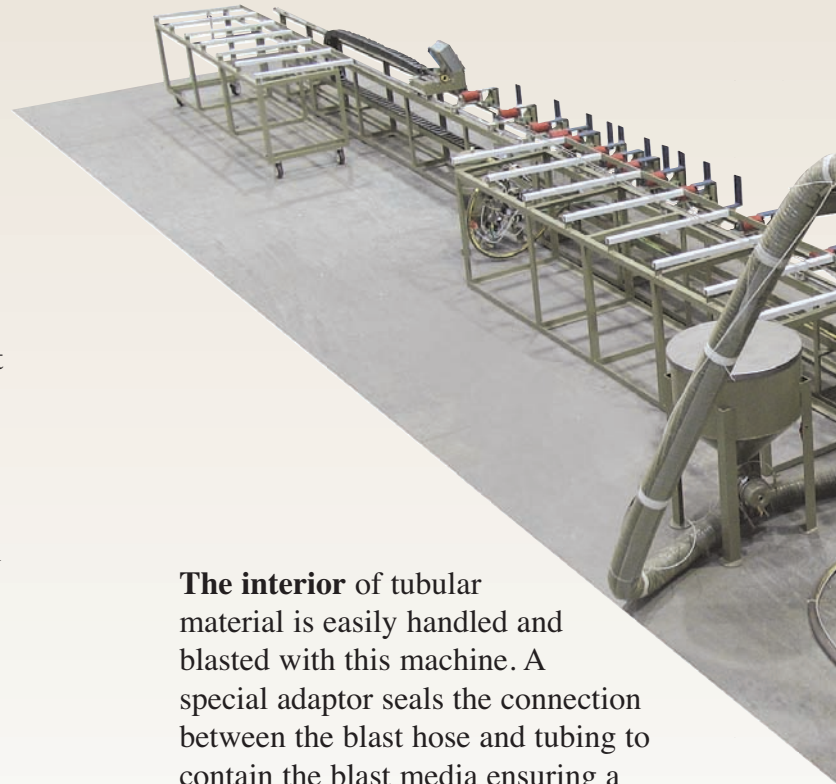
**Continuous table** automation features acoustical foam for noise control; rotary nozzle head drive and reclaim fill door are easily accessed from above; safety cage provides full protection.



**Through-feed** conveyor machine with powered rollers and oscillating nozzles automates the blasting of heavy parts.



**An automated** indexing cabinet for tall, linear parts features a part-holding clamp system and light curtain safety device to shut down the machine if an operator or object should move into the rotating table area.

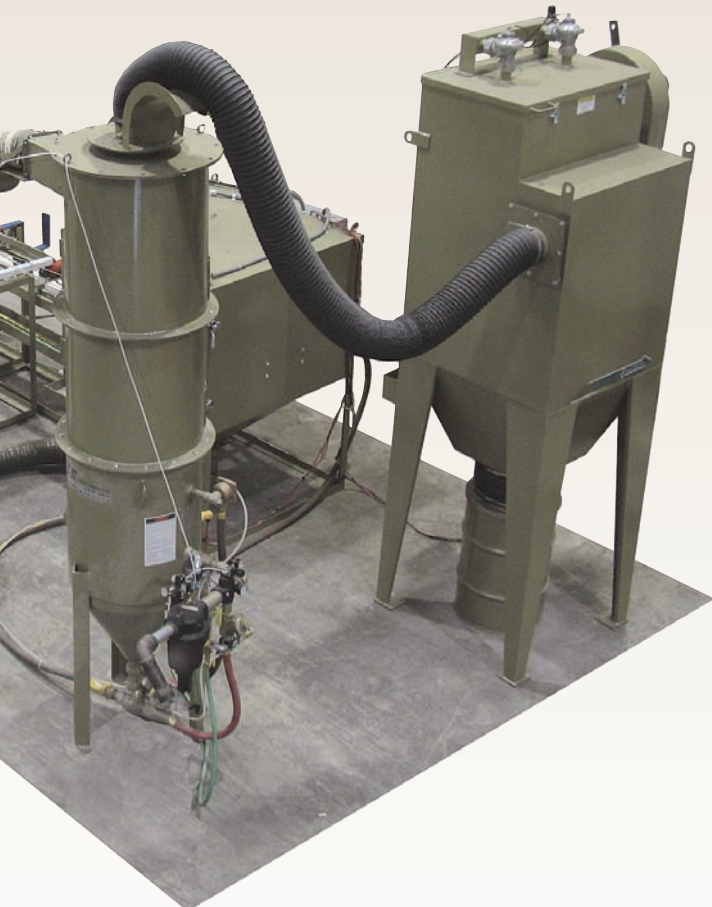


**The interior** of tubular material is easily handled and blasted with this machine. A special adaptor seals the connection between the blast hose and tubing to contain the blast media ensuring a clean work area. A catch cabinet captures spent media for reuse.

**GOLF CLUBS • GUN PARTS • HEATING ELEMENTS • I BEAMS • KNIVES • BULBS • MAIL BOXES • BOLTS • PIPES • POSTAGE METERS • RADIATORS • REFRIGERATION EQUIPMENT • REFRIGERATORS • SPRINGS • STAINLESS STEEL TUBING • STAINLESS STEEL SINKS AND DRAINS • TOOLS**



**Shot peening** machine with custom paint, vertical nozzle oscillation and vibratory classifier precisely and simultaneously processes the interior and exterior of parts.



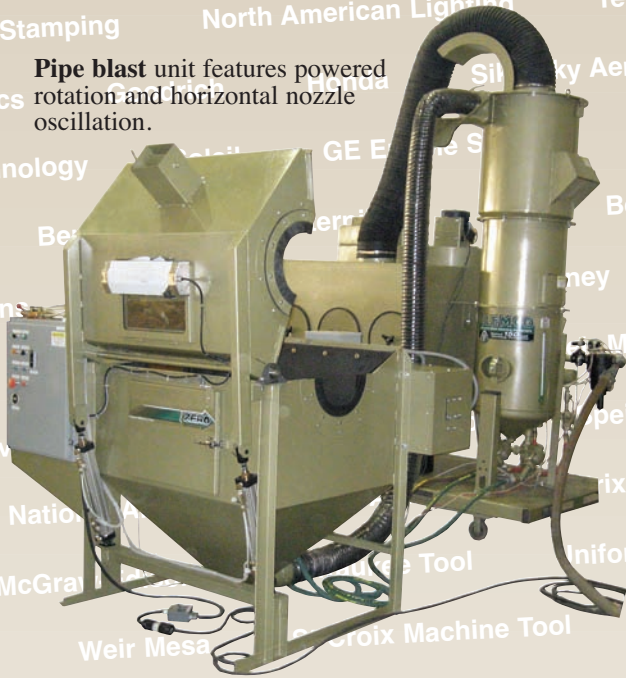
**Special pressure-blast** tumble-belt machine uses nozzle traverse mechanism for parts cleaning.



**ILBOXES • MOLDED PLASTICS • NAIL SETS • NUCLEAR FUEL ROD SHIELDS • NUTS & SOCKET HOUSING • RUBBER BUMPERS • SHUTTERS • SAW BLADES • SPARK PLUGS • BOLS • TORSION BARS • TRAINS • TROPHIES • TRUCKS • TURBINE • ZIPPO LIGHTERS**

Pipe blast unit features powered rotation and horizontal nozzle oscillation.

Tumble-belt cabinet for batch blast cleaning of parts.

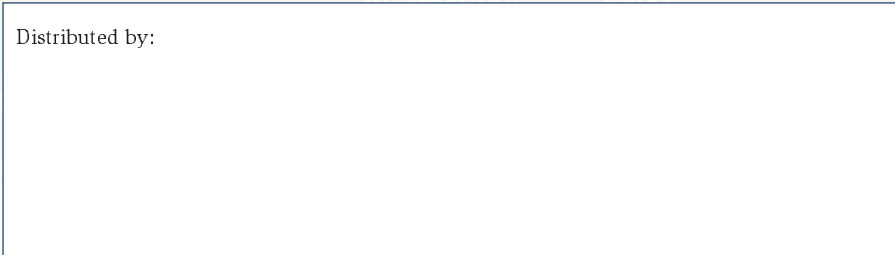


# Automation

Indexing turntable shot peening system with vertical nozzle oscillator, vibratory separator, and precision indexer.



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