

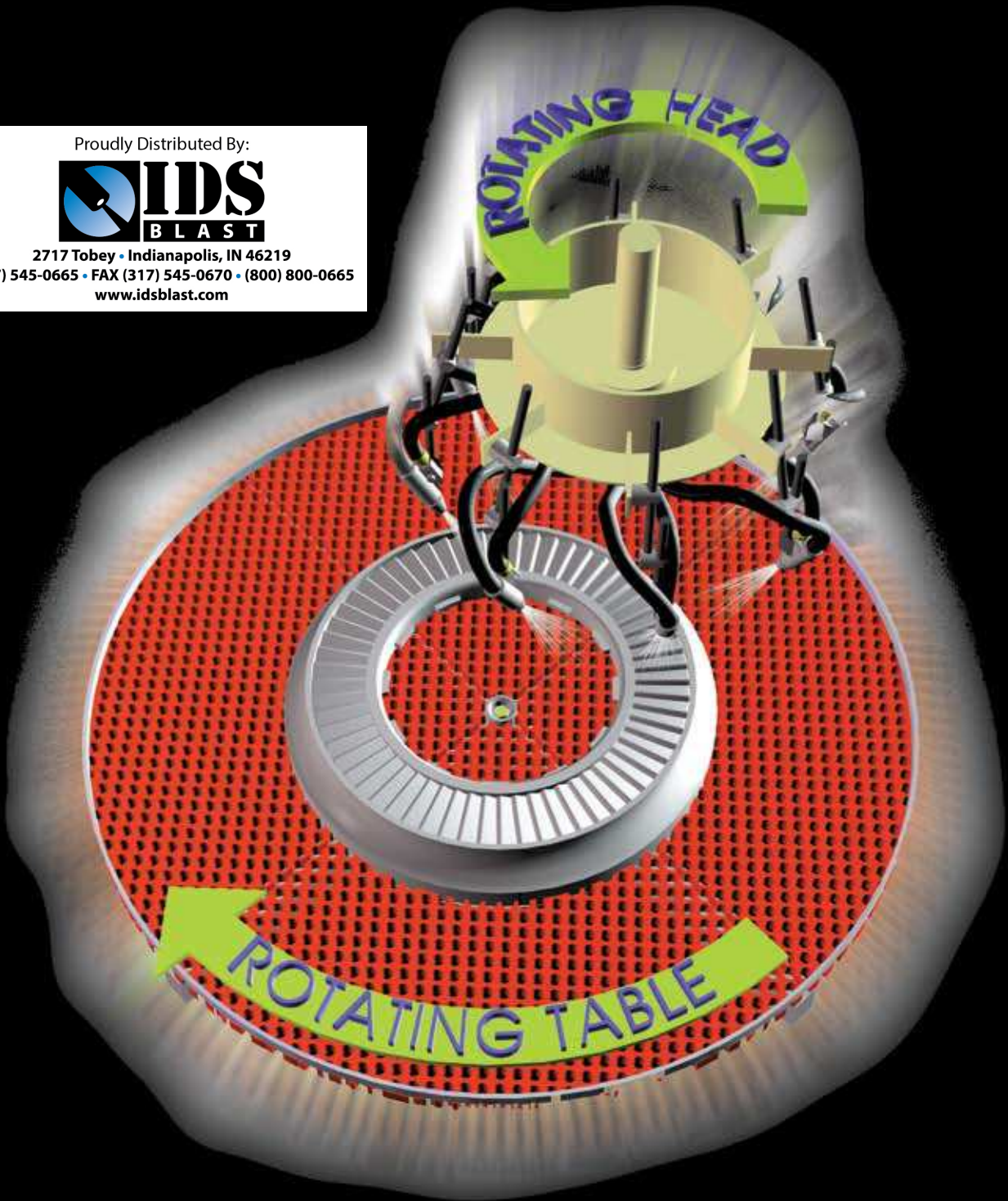
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**Engineered for Low-Cost Cleaning,
Peening, Profiling & Finishing
at High-Production Rates**



EMPIRE: THE LEADER IN AIR-BLAST TECHNOLOGY

Empire continues to lead in the design and manufacture of abrasive air-blast equipment by sustaining the focus and ingenuity that spawned the company more than sixty years ago.

Today, Empire produces the world's most extensive line of air-blast products, including portable blasters, blast cabinets, blast rooms, and automated systems in configurations to meet almost any requirement.

Our many hundreds of field-proven, automated-blast systems range in sophistication from turntable cabinets to computer-controlled machines developed for unique production processes. These systems descale, decorate, deflash, deburr, etch, finish, clean, profile andpeen parts throughout the world with users reporting productivity gains of up to 700 percent, due in large part to the enhanced quality control inherent with automated systems.

Empire has the experience, innovative engineering, test facilities and production capabilities to automate almost any air-blast process at a price that will produce a very attractive return on your investment.



Empire Abrasive Equipment Company, headquartered in Langhorne, Pennsylvania, specializes in the development of air-blast systems and equipment.

BEST-EQUIPPED TEST LAB AND DEMONSTRATION CENTER IN THE WORLD



Our test lab and demonstration center in Langhorne, PA, is the world's largest. It enables us to sample blast parts, as well as demonstrate standard approaches to automated blasting. Machines shown, which should interest prospective users concerned about the higher equipment costs associated with custom engineering, include a standard in-line machine (Model: IL-885), one of our indexing turntables (Model: TT-36-S), a cabinet equipped with a rotary blast head (Model: PF-6060-RS), and a batch-processing basket blaster (Model: BB4-3K).

A TRACK RECORD OF "FINISHING FIRST"



Shifter forks etched with ALOX

Cylinder surface profiled with ALOX



**Parts BEFORE and AFTER
air-blasting with EMPIRE
machines**



Copier tube etched with silicon carbide

Collar deburred with glass beads



A FULL RANGE OF AUTOMATED EQUIPMENT



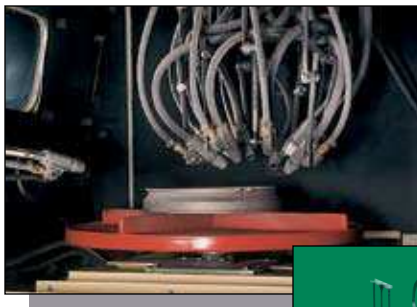
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INDEXING TURNTABLE MACHINES

This programmable, indexing turntable machine reduces per-unit cleaning costs on piston rebuilds by over 30 percent compared to previous methods.



By coordinating the movements of 16 blast guns, oscillating vertically and horizontally, with spinning work stations on a rotating platform, the system ensures thorough coverage and fast cleaning in a single pass. Eight guns oscillating vertically clean the sides and skirts of the pistons. The guns sweeping horizontally clean tops and interiors.

FEATURES

Because of their versatility, our indexing turntables handle a wide range of high-production jobs at a very attractive cost. Some of the features and options contributing to the unexcelled performance of our indexing turntables are listed below. **We can tailor these machines to meet your needs with a minimum of custom engineering.**

- Machines can be equipped with a variety of nozzle/gun configurations ranging from infinitely adjustable holders to horizontal and/or vertical oscillators interfaced with programmable controls.
- Part-rotation and nozzle-oscillation speeds are adjustable to accommodate a variety of part sizes.
- Standard machines include an exit vestibule, equipped with a blow-off manifold, and an inlet vestibule. These features separate the operator from the noisy blast environment while increasing production by cleaning the part of residual media and dust during the blast cycle.
- Pneumatic, vertically sliding doors speed up loading, constrain blast debris and reduce noise when equipped with a sound attenuator.
- You have the choice of air-blast systems powered by pressure, continuous pressure or suction.
- A pull-down shade protects the viewing window in the maintenance-access door. Quarter-inch-thick neoprene lining protects the interior of the cabinet, prolonging the life of metal surfaces. A large access door simplifies maintenance.
- An automatic media-replenishing system boosts productivity by minimizing downtime for refills and returning clean media to the system for more consistent air-blast results.
- Replaceable media-return duct features urethane to prolong tube life and reduce maintenance costs.
- Optional infrared curtain starts and stops blasting automatically. The curtain frees operators to perform other tasks while blasting is in progress.
- Door, latch and hinges are heavy duty, built to last.
- Select from three standard models: Empire's 20" table with a space-saving footprint or larger 36" and 48" indexing machines.
- Specify 6, 12, 18 or 24 work stations depending on the size of the turntable you choose.
- Machines can be designed for pick-and-place or robotic loading and unloading of work pieces with the addition of a precision turntable and infrared curtain.
- Custom fixtures and masking are available to meet special application requirements.

STANDARD EQUIPMENT

Model	TT-20	TT-36	TT-48
Number of stations	6	6	6
Capacity per station	20 lbs	20 lbs	20 lbs
Turntable diameter	20"	30"	48"
Maximum part size (diameter and height)	6" x 14"	12" x 20"	20" x 20"

MULTIPLE NOZZLES/GUNS AVAILABLE

Model	TT-20	TT-36	TT-48
Suction guns	Up to 8	Up to 12	Up to 24
Pressure nozzles	Up to 6	Up to 8	Up to 8



The indexing turntable shown above blasts a variety of cooking containers, including quart pans, 12" frying skillets, and 16" Dutch ovens. This six-station turntable, with a dual-chamber, continuous-action pressure vessel, supports six blast nozzles, which finish two parts at a time within this automated system. A vertical door, working internally, separates blast and blow-off stations. Pneumatic lines power the movements of exterior and internal doors. The machine's controls interface smoothly with pick-and-place or robotic loading devices.

BATCH PROCESSING

Our batch processing systems, which include both continuous and indexing turntable machines, are ideal for parts requiring long blast cycles. In the typical work scenario, the operator loads work pieces onto the turntable, sets the timer, starts the machine and returns when the cycle is completed. By adding a blow-off manifold and timer, which automatically remove residual material from the part and turntable, the operator is freed from the often dusty task of manual blow-off.

Empire's PF-4848-RS with a 36-inch turntable, our PF-6060-RS with a 48-inch turntable and the PF-7272-RS with a 60-inch turntable feature rotating blast guns that assure even coverage. Blast-head and table-rotation speeds are both variable to meet a wide range of production requirements. Rotary blast heads for these machines are available with four, six or nine blast guns.



The PF-6060-RS system shown to the left features two powered turntables that roll through the blast enclosure on tracks and welcome deliveries from overhead cranes. Used to clean heavy molds, the machine enables loading and unloading of parts while blasting is in progress. It also includes a manual operator station with jog controls to facilitate touch up.

CONTINUOUS PROCESSING

Empire offers turntable and in-line machines for continuous processing. These systems can be loaded and unloaded manually, equipped with robotic arms or designed as an integral part of the production line.

Our continuous turntable machines come in four standard models with table diameters ranging from 36 inches up to 108 inches. Larger units are available with two rotary blast heads. The heads can be oriented to perform separate functions, such as blasting the interior and exterior of parts at the same time. Standard features include a rubber cabinet lining and a urethane coating on the turntable for extended service life.



The unique in-line system shown to the left employs eight pressure nozzles to create an anchor pattern on sheets of steel and aluminum for improved adhesion of a rubberized coating. Remarkably, the machine handles sheets of up to six feet by 12 feet in an equipment package fewer than 13 feet in height. This low profile, achieved in part with the use of a bucket elevator for media recycling, was dictated by customer space constraints.

CELL MACHINES

Empire's single-station cell machines serve as just one example of how we meet the ever-changing demands of manufacturers worldwide. Our cell machines reduce inventory requirements and conserve floor space, giving many customers the winning edge in an increasingly competitive global marketplace.



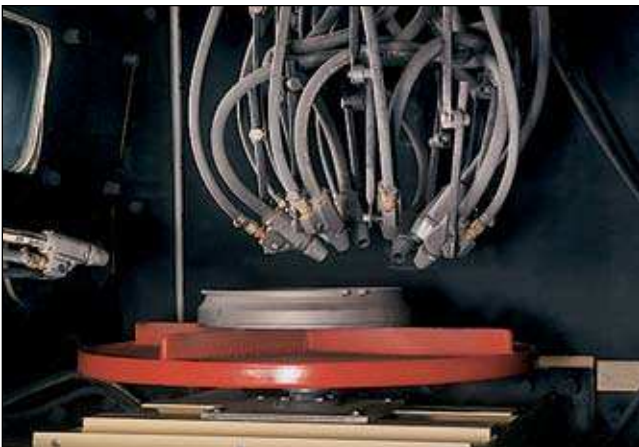
Empire cell machines package our automation arsenal into compact systems designed to conserve space and keep parts jumping through the production process. The actions of these systems can be coordinated through programmable controls, if required, to synchronize blast pressures and duration, nozzle movement, part orientation and other variables affecting cleaning, peening and finishing operations. Our test lab and engineering staff work imaginatively with customers to deliver the "leanest, cleanest" machine for the job.

ROTARY HEADS

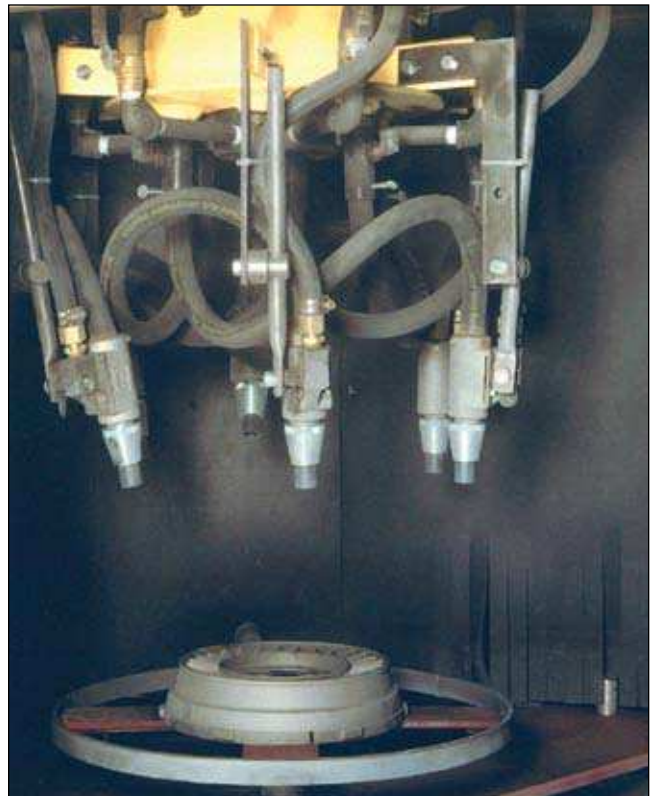
Empire's rotary blast head delivers tremendous coverage while conserving compressed air. When the application calls for it, our rotary head will outperform any horizontal-nozzle oscillator, including our own, by reducing the number of blast guns and energy required for the job. Our rotary heads contribute to the outstanding performance of our in-line conveyor, continuous turntable and batch turntable machines.



Adjustable blast-head clearance and nozzle angles, combined with variable head and turntable speeds, not only make Empire rotary-head machines versatile; they also assure precise control of cleaning and finishing processes.



To process flat parts uniformly, a horizontal oscillator extends the reach of the rotary head shown above. With the addition of the oscillator, the single six-gun head provides even blast coverage and consistent finishing results from the center to the circumference of the system's 48" powered turntable.



AUTOMATED SHOT-PEENING MACHINES

Empire continues to develop air-blast peening systems with advanced computer-control, blast-coverage and material-handling features that not only increase productivity, but also assure repeatability—a major concern in these quality-intensive applications affecting the structural integrity of critical components.



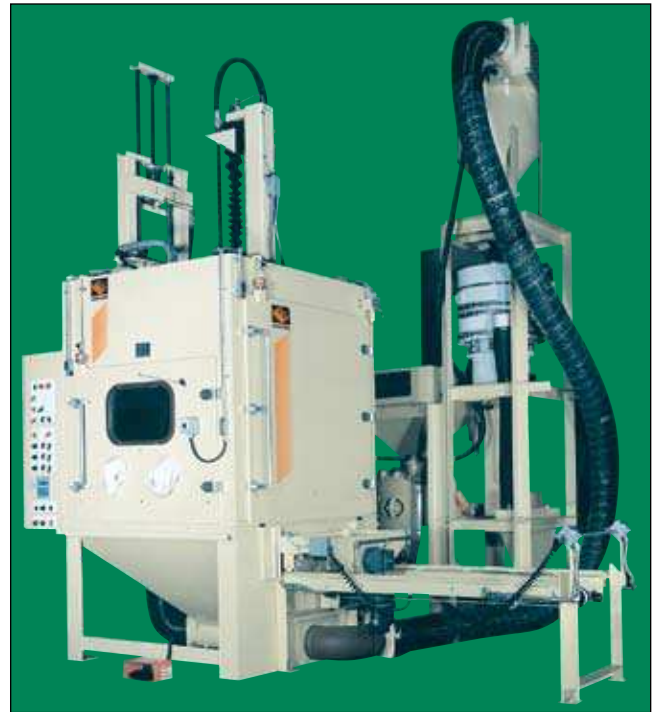
Interface terminal enables operator to designate blasting parameters such as nozzle stroke length and oscillation speeds, ON/OFF status of selected nozzles, part rotation speeds, and blast duration by simply inputting the appropriate part identification number.



Versatile peening machine enabled a repair center for jet-engine parts to expand its business into the areas of disc and hub rebuilds. In addition to peening recessed surfaces, the unit processes many different size parts ranging up to thirty inches in diameter.



Glass-bead system for peening jet-engine turbine blades incorporates vertically oscillating nozzles, a vibratory bead classifier, and one rotating work station.



This multi-purpose shot-peening system includes an ID blast lance to peen recessed surfaces on parts, a powered loading cart, independently adjustable pressure nozzles, a shot classifier, and a combination of vertical/horizontal oscillating blast nozzles. Operating parameters are adjustable, making this machine ideal for job-shop work.

FOUR-AXIS MACHINES



Empire produces mold-cleaning machines capable of handling parts up to 65 inches in diameter and 10,000 pounds. The system shown below includes two turntables so loading and blasting can be performed simultaneously. To enhance versatility as well as further expedite cleaning, the system features a recipe-storage capability through which processing parameters for specific parts can be recalled with fingertip ease. In addition, a three-axis nozzle manipulator, shown to the right, provides easy access to hard-to-reach areas from above or below the part.



DUST COLLECTORS

Empire offers a large selection of dust collectors to support high-volume air-blasting.

The EM cartridge collector, shown to the left, increases air flow, expands filtration area and cleans filters automatically. The collector's filter-cleaning system includes, as standard equipment, a photohelic gauge that responds to high and low set points, measured by the pressure differential across the filtering material, to activate the jet-pulse cleaning process. Once the pressure limits have been set, these collectors essentially clean themselves.

The collector's intake area is specifically designed to extend the life of interior components and surfaces exposed to abrasive media. Its horizontal cartridges are easy to replace, provide large filtration area and capture 99.999% of particles one-half micron or larger.

Most Extensive Product Line in the Industry

BLAST CABINETS—Our “All-in-One” ProFormer™ cabinets work big on a small footprint. Like the rest of our Pro-Finish® cabinet line, they are built for non-stop production. We also offer modified blast cabinets to meet special production requirements, in addition to an Econo-Finish® line for lighter duty service. For stripping and cleaning workpieces with sensitive substrates, we produce FaStrip® and SafeStrip® cabinets specifically designed to handle light media.



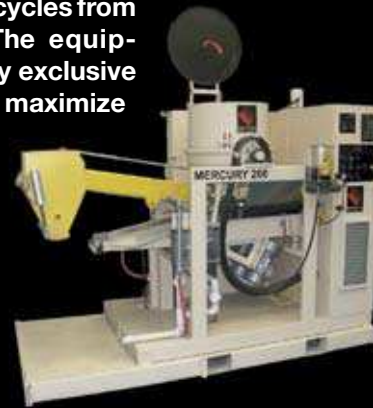
PORTABLE BLASTERS—We produce economical suction blasters, SafeStrip® portables for handling light media, a full line of SuperBlast® portables for big jobs, plus recovery systems compatible with our equipment as well as other pots.

Our FaStrip® portable systems—engineered for use with plastic media—and PRS Blast & Recovery machines both include a media recovery hopper, a tunable media reclaiming and a highly efficient dust collector that reduces HVAC costs by recirculating cleansed air back to the work environment.



BLAST ROOMS—Empire builds pre-assembled and field-erected rooms with recovery options ranging from “sweep and shovel” hoppers to full recovery floors supported by media wash and recycling systems. Vibratory and screw-type floors are available. We also design and manufacture custom rooms capable of meeting your most exacting production requirements.

CENTRIFUGAL-DISC MACHINES—In addition to air-blast equipment, Empire now offers high-energy, centrifugal-disc systems that slash deburring cycles from hours to minutes. The equipment includes many exclusive features designed to maximize output and minimize maintenance requirements.



**SILICA SAND IS NOT TO BE USED
IN ANY EMPIRE BLAST EQUIPMENT.**



EMPIRE™
ABRASIVE EQUIPMENT

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