



EMPIRE™

Air-Blast Buying Guide

PORTABLE
SYSTEMS



PORTABLE
SYSTEMS

EMPIRE: A LEADER IN AIR-BLAST TECHNOLOGY FOR OVER 50 YEARS

Empire has specialized in designing and manufacturing abrasive-blasting products for over fifty years. Today, we produce the most extensive line of air-blast equipment in the industry. Starting with the production of portable blasters, Empire has emerged as a leader in air-blast technology.

In addition to portable systems, we manufacture blast rooms, a full spectrum of blast cabinets—ranging from economy to custom—and a wide variety of automated air-blast systems.

Our extensive experience enables us to offer you the most up-to-date, dependable and cost-saving equipment available. By continually applying technology developed for specialized applications to our standard product lines, we stay at the forefront of our industry. Through a national network of distributors, we support customers with quick access to replacement parts, accessories, training and field-repair services.

Just check your yellow pages. You'll find an Empire distributor nearby.



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

THE INDUSTRY'S MOST EXTENSIVE LINE OF AIR-BLAST EQUIPMENT

Blast Rooms—We build both preassembled and field-erected blast 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 both available. In addition, we build custom rooms for applications requiring specialized features.



Blast Cabinets—Our standard line of Pro-Finish® cabinets offers many factory options, most often enabling finishers to meet production objectives without modifications.

We also produce Econo-Finish® cabinets designed for lighter duty service.

To strip and clean workpieces consisting of delicate substrates, we offer FaStrip® cabinets for use with light media such as plastics.



Automated Systems



We have designed and produced hundreds of automated pneumatic-blast systems, ranging in sophistication from continuous and indexing turntable cabinets to machines developed specifically for unique production processes. If you need basic automation, such as machines equipped with timers, powered loading devices or oscillating nozzles, we can deliver at a very attractive price. For fully automated systems, we should be your first choice, too. Besides reporting gains in productivity of between 100 and 700 percent, our customers point to enhanced quality control as a major reason for automating with Empire.

THE DEEPEST PORTABLE LINE-UP IN THE INDUSTRY



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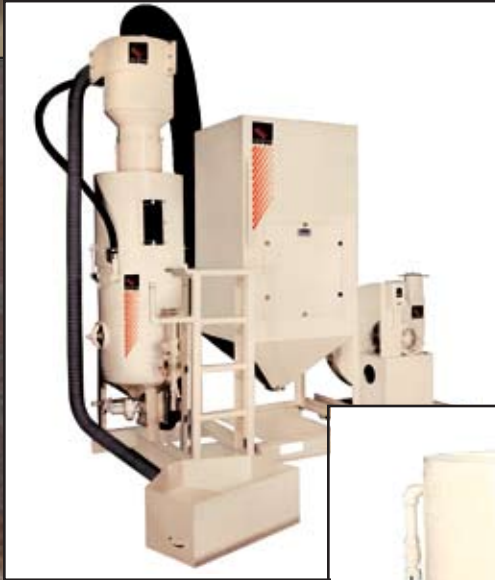
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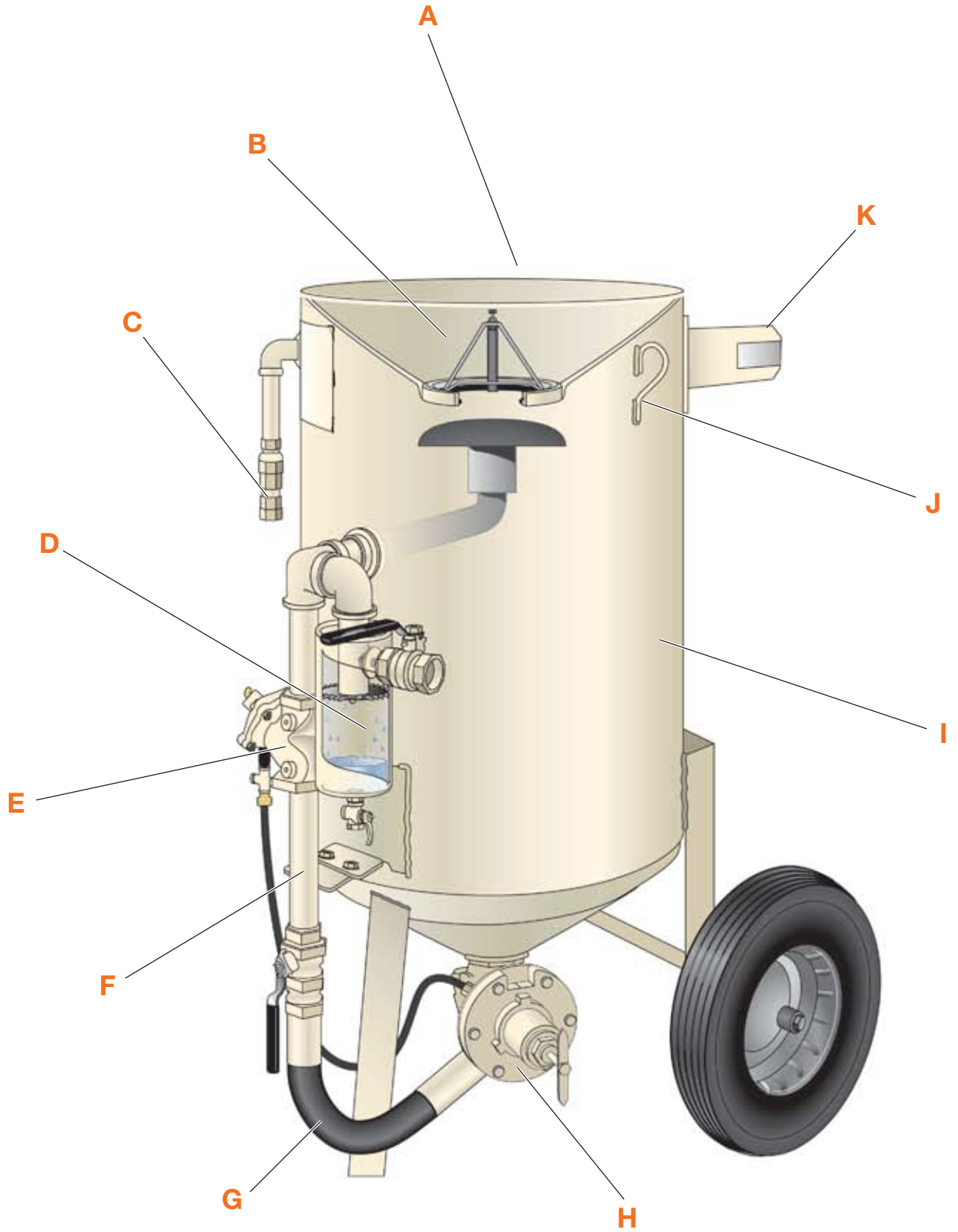
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780 Shown

SuperBlast®: KING OF THE HILL

When we designed the SuperBlast line, we didn't stop with technological advances such as the Sure-Flo® grit valve. We continued to introduce features—some major and others minor—all aimed at adding profit to your operations. From top to bottom, SuperBlast portables are built to keep you ahead of the competition and king of the hill.

They give you an extra one-half bag (50 lbs) capacity and come in stationary models suitable for truck mount or blast rooms. In addition, they can be incorporated into Empire's PRS, a pneumatic recovery system enabling you to recycle media. Plus, they're backed by the best warranty in the industry: **THREE YEARS LIMITED!**

Just take a look at the features. They prove no other portable comes close.

A

Low profile reduces the strain of lifting heavy bags of grit. Deep position of built-in screen eliminates the need for height-raising add-on screens.

B

E-Z Fill™ (Patent No. 4,557,825) breaks bags on contact, eliminating cutting and manipulating heavy bags. Built-in screen stops debris that clogs and shuts down other types of blasters. Large, six-inch opening saves time by permitting faster refills.

C

Sound attenuator reduces noise.

D

Dry-Flo™ moisture and oil separator keeps you blasting by removing water that can lead to media caking or freezing and assures smooth media flow. It keeps you up and running, even under adverse conditions.

E

Compact, front-mounted controls reduce the chance of damage when loading or unloading from trucks. **Slim design** lets you wheel SuperBlast through narrow doorways with no damage to piping. **Petcock**, a safety precaution, allows you to signal the operator and shut down the system at the pressure vessel.

F

Large piping assures ample air-volume for high-speed blasting. 1" provided on 350 models and 1-1/4" on 650 and 1050 models.

G

Flexible air line simplifies maintenance, prevents air leaks and eliminates performance-robbing pressure drops caused by multiple fittings.

H

The **Sure-Flo grit valve** delivers reliable, precise performance and can be serviced easily in the field.

I

Rugged pressure vessel, with a rated working pressure of 125 psi, meets ASME and National Board standards.

J

Lifting eyes simplify loading onto trucks.

K

Wide handle with guards makes moving easier and safer. You can store the unit upside-down because it has no above-rim projections.



Large, side inspection port provides quick access to vessel interior.

SPECIFICATIONS

Model	350	650	1050
Pressure vessel construction	ASME	ASME	ASME
Media capacity (lbs)*	350	650	1050
Tank diameter	18"	24"	30"
Filling height	40"	50"	58"
Weight (lbs)	250	415	750

* Media capacity is based on a bulk density of 100 lbs per cubic foot.

SuperBlast XL PACKAGES

SuperBlast portables are available in three sizes with 3.5 ft³, 6.5 ft³ and 10.5 ft³ media capacities. All three models, designated as "350," "650" and "1050" respectively, can be purchased with either 680 (pressure release) or 780 (pressure hold) remote control systems and with XL packages including the following OSHA approved accessories:

- Air-fed respirator helmet including 50 helmet lenses
- Personal air filter
- 25-foot starter breathing hose
- 25 feet of blast hose with couplings for 350 model
- 50 feet of blast hose with couplings for 650 and 1050
- DC3-4 Di-Carb nozzle for 350 model
- DCV-6 Di-Carb nozzle for 650 and 1050
- Package of 10 coupling washers
- Package of 10 nozzle washers

BLAST & RECOVERY SYSTEMS

With Empire's pneumatic blast and recovery system (PRS), you can tap the cost-saving advantages of more durable media for only a modest investment. The PRS lets you move up to recyclable media such as aluminum oxide, chilled iron and steel grit, which can be used effectively over and over—from 6 to 200 times. Conservative studies show an investment in a PRS is recouped in as few as ten weeks in terms of reduced costs for replacement media, disposal of spent media and man-hours required to move this material around. After that, years of higher profits lie ahead.

The PRS relies on an exclusive cyclonic media reclaimer, which extracts good, reusable media from unwanted dust and debris. As a result, you get consistent performance from your media cycle after cycle.

The PRS incorporates a SuperBlast 650 pressure system with 780 remote controls for ease of operation and maintenance. A dust collector, which captures 99% of particles one micron in size, permits conveying air to be recirculated into the workplace, thereby reducing HVAC costs. The system's 10-horsepower blower extends effective work area and recovers media at rates exceeding 70 pounds per minutes. These units handle media sizes up to A-12 aluminum oxide and G-25 steel grit.



Pneumatic Blast & Recovery System pays for itself quickly by recycling durable media.

FaStrip® PORTABLES

When stripping operations involve delicate surfaces or require precise removal of old coatings, nothing beats FaStrip machines for speed, quality, safety or economy.

By delivering plastics, wheat starch or other soft media at low pressures, FaStrip makes it possible to strip delicate metallic or composite materials quickly and thoroughly without damaging the substrate.

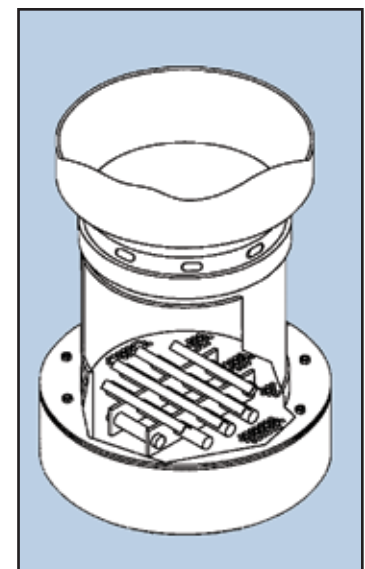
Compared to alternative stripping methods, Empire's FaStrip process offers a number of major benefits. When chemical agents are used to remove coatings, for example, rubber components, windows and other vulnerable areas must be thoroughly protected. Otherwise, those materials, plus underlying structures and controls, may be damaged. Also, residual caustics can later damage fresh paint.

With FaStrip, most of this prep work is unnecessary. For instance, masking does not have to be extended beyond the windows on to the paint, so a great amount of manual detailing is eliminated.

Because the FaStrip process does not employ toxic chemicals, it is safer for workers and the environment. In addition, less time is required for cleanup and the high costs for disposal of hazardous chemicals are reduced or eliminated.

In short, Empire's FaStrip process offers three compelling advantages over alternative methods. It's faster, safer and more efficient, which all adds up to better results and higher profits when you're stripping expensive equipment.

FaStrip machines are available in cabinet models as well as portable units similar in configuration to the pneumatic blast and recovery systems shown above.



*Similar in design to Empire's PRS, FaStrip portables include special features for assuring smooth flow of plastics and other light media. **Magnetic separator** (shown left) extracts ferrous debris capable of damaging delicate substrates.*

Econo-Blast™ PORTABLES

Econo-Blast portables are compact pressure blasters that share many features with their big brother, SuperBlast. Available in three sizes with grit capacities of 1, 1.5 and 3 cubic feet, these portables include ASME vessel certification for safety, flexible air hose for ease of maintenance, wheels for portability and a pressure gauge. Less grit capacity and smaller nozzles make these units ideal for spot blasting and detail work, particularly on a limited budget.

Larger Econo-Blast models can be equipped with Empire's patented Sure-Flo grit valve and 680 or 780 remote controls, described on page 9, for safety. With these controls, blasting stops when the nozzle is released.

Complete packages are available to protect the operator from blasting and potentially hazardous dust per OSHA requirements. Further, these packages include all the blasting equipment and accessories necessary to get you up and running safely.

XL Packages offered with 150 and 300 models contain the following items:

- Air-fed respirator helmet with 50 helmet lenses
- Personal air filter
- 25-foot starter breathing hose
- 25 feet of blast hose with couplings
- DC3-3 Di-Carb nozzle
- Package of ten coupling washers
- Package of 10 nozzle washers

Using a 3/16" nozzle, Econo-Blast portables require only 38 SCFM at 80 psi and can be equipped with smaller nozzles to accommodate smaller air compressors.

SPECIFICATIONS (Econo-Blast™ Portables)

MODEL	P-100	P-150	P-300
Pressure vessel construction	ASME	ASME	ASME
Media capacity (lbs)*	100	150	300
Tank diameter	12"	12"	16"
Filling height	28"	36"	44"
Weight (lbs)	50	80	102

SPECIFICATIONS (SafeStrip™ Portables)

MODEL	SS-1	SS-2
Media capacity	1 cubic foot	1.5 cubic feet
Height		
With loading hopper	47"	53"
Without loading hopper	38"	44"
Diameter	12"	12"
Width	22"	22"
Length	26"	28"
Fixed orifice sizes	1/8", 5/32", 3/16"	1/8", 5/32", 3/16"
Cone angle	45 degrees	45 degrees
Weight	196 pounds	245 pounds

Econo-Blast portables provide an economical option for occasional heavy work, spot blasting and detailing.



P-100



SS-1



SafeStrip™ PORTABLES

Empire SafeStrip™ portables are designed specifically to handle fine, light media used in the cleaning and stripping of delicate substrates. SafeStrip portables quickly and safely remove old coatings, dirt, oil, corrosion and other unwanted residues from soft metals, rubber, plastics and other sensitive surfaces. They are ideal for work on statues, monuments, machinery and molds, and in many other applications requiring a "light touch."



PREMIUM BLAST NOZZLES

Empire's nozzles are designed to our specifications for peak performance, and they offer a wide selection so you can pick the nozzle best suited for a particular task. Three basic types are available: straight-bore, venturi and angle nozzles. **Straight-bore nozzles** concentrate the grit pattern and are best for reaching deep recesses and spot blasting. Shorter models are best for close-up work; longer versions are used for distances over one foot. **Venturi nozzles** accelerate grit to higher velocities for more impact while fanning out the pattern for uniform

and wide coverage. As a result, they perform work much faster and consume 20% less media on a typical job. **Angle nozzles**, which turn the blast stream around a corner, are applied on the interior of pipes, cylinders and other hard-to-reach surfaces. All SuperBlast nozzles feature 1-1/4", machined-brass or hard-anodized threads to prevent galling and assure a secure fit for added safety and durability. Nozzle jackets are available in urethane, aluminum or brass. Your choice of liner materials includes silicon carbide, boron carbide and Di-Carb™ (high-grade tungsten carbide).

OTHER QUALITY ACCESSORIES



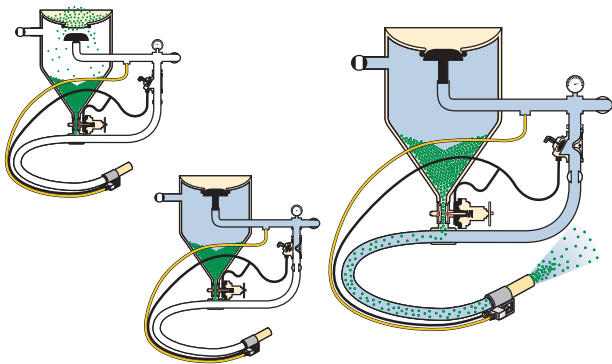
Go with Empire equipment when you want the best in blasting accessories. Our **premium blast hose** withstands abuse and is consistently sized for easier mating with hose couplings. We offer **tank couplings** for a secure fit with the media regulator. Our **nozzle couplings**, also available in quick-connect style, are threaded for

a square fit. **Quick-snap couplings** provide fast connect to primary hose or extensions. Our **pressure tester** gives an accurate reading at the nozzle. **Wet-blast heads** suppress dust by enveloping the blast spray with a fine water mist. The **Sure-Flo pinch tube** (bottom right) is highly durable and easy to replace in the field.

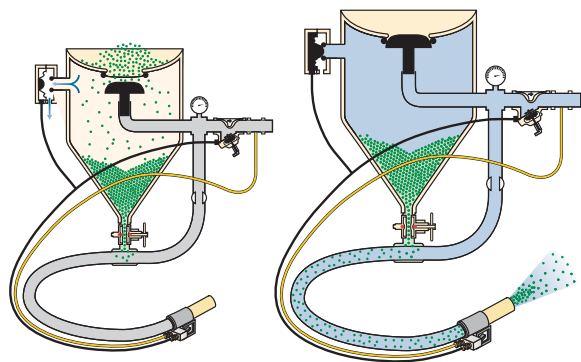
CONTROL SYSTEMS DESIGNED FOR SAFETY AND PROFIT

Empire gives you the choice of two remote operating systems. Either can be specified with pneumatic or electric controls and all conform to OSHA. The four configurations share a simple, reliable design that shuts down blasting when the “on/off” trigger is released for operator safety. The key difference between the electric and pneumatic arrangements is that the electric systems perform better in cold weather and provide faster “start/stop,” especially when the pressure vessel is far from the operator.

Manual controls, which can later be upgraded to remotes, are also available, but these systems require a tender at the vessel to assist in operating the system.



780 (pot-under-pressure) controls, used with Empire’s SuperBlast, PRS and FaStrip systems, stop blasting when the “on/off” trigger is released while maintaining pressure in the vessel. This arrangement, which conserves compressed air and is easiest on system components, is especially useful for spot blasting because of the fast restarts it provides.

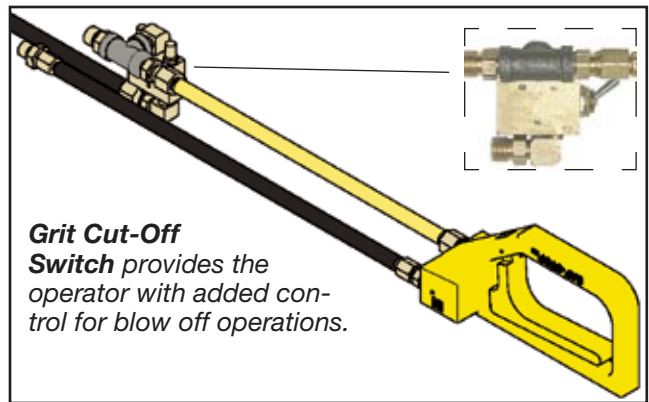


680 (blow-down) controls, used on SuperBlast and Econo-Blast portables, vent pressure from the vessel when the “on/off” trigger is released. This setup makes blasting easier for a single operator and permits automatic grit refills.

Saf-Stop II™ Safety Switch

Empire’s **Saf-Stop II control device** (Patent No. 3,834,082) adds essential safety to any blasting operation by shutting down the system if the pneumatic control hose gets cut, crimped or crushed. The control comes with a large, easy-to-manage handle protected by a guard.

Another control option, which can be added to the handle, is Empire’s grit cut-off switch. With the switch installed, media feed to the air line can be turned on and off, enabling the operator to blow off media and dust before parts exit a blast enclosure.

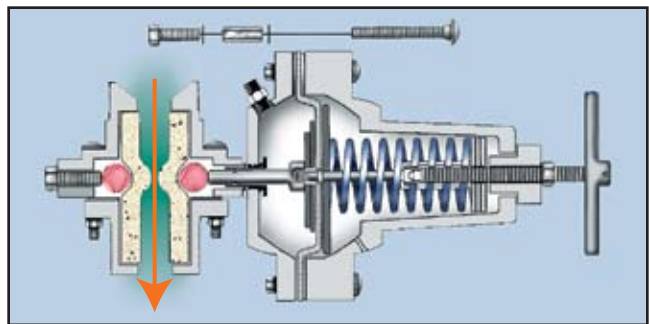


Grit Cut-Off Switch provides the operator with added control for blow off operations.

The Sure-Flo® Grit Valve

A key to the popularity of SuperBlast portables is our **Sure-Flo grit valve and media regulator** (Patent No. 4,518,145). The media path through the valve is straight down, assuring dependable flow. Abrasive media contact only one part, a gum-rubber pinch tube. Not only is the tube exceptionally long lasting, it is also inexpensive and simple to replace—even in the field—meaning you enjoy more productive time and virtually maintenance-free operation.

With the Sure-Flo, metering is easy and precise, saving you mountains of media. It’s as simple as turning a handle. Also, a variety of tube sizes are available to meet special application requirements.



Patented **Sure-Flo valve** brings any blaster up to a higher level of performance and, when teamed with Empire products, the combination is unbeatable.

OPERATOR SAFETY GEAR

We offer a complete line of equipment and clothing to protect your operator and other people close to blasting operations. To be effective, however, this gear must be properly applied and maintained. All devices affecting breathing-air quality—including filters, alarms and the air source—should be inspected and

serviced regularly, particularly when a multi-purpose compressor is used to supply breathing air.

You can purchase our safety gear as individual items or as a package when you buy an Empire blaster. All Empire safety equipment is NIOSH approved to comply with OSHA when the operator is fully equipped.

Rugged, canvas-weave jacket has snap fasteners and a tight-sealing waist adjustment to keep out grit.

Air conditioner keeps operator cool in hot working environments.

Personal air filters remove moisture, oil, fumes, dust and particles from compressed air at better than 99% efficiency. Available in models for up to four operators. **(Filters do not remove carbon monoxide.)**

Portable and fixed carbon monoxide (CO) monitors (not shown) sound an alarm to warn of excess CO in air being delivered to the operator.

Air-fed blast hood respirator protects operator from inhaling abrasives and dust when used with an approved air filter.

Remote controls shut down system automatically when trigger is released.

Leather gloves stand up to abrasives and rough material handling.

Canvas pants, with reinforced belt loops and snap-fasten fly, protect legs from blast ricochet.



Breathing Air Pumps supply filtered air to the hood respirator, thereby eliminating the air compressor as a potential source of contamination and possible carbon-monoxide poisoning. Suitable for one or two operators, these units are easy to maintain and can be powered electrically or with compressed air.



SAFETY IN SUMMARY

- Make sure the operator is receiving grade “D” breathing air as described in the Compressed Gas Association commodity specifications G-7.1, 1996.
- Provide clothing which protects the eyes, face, hands and body from blast ricochet.
- Employ a control system that shuts down automatically when the trigger is released.
- Assure pressure vessel is ASME certified.
- Do not use silica sand as an abrasive.
- Keep other personnel a safe distance from blasting operations or provide them with adequate safety gear.

APPLICATION CONSIDERATIONS: SYSTEM SELECTION AND SIZING

The charts below will help you maximize your investment in a portable blaster. They assist in coordinating the size of components as well as selecting the Empire unit best suited for the type of work you normally perform.

System Sizing Chart (at 100 psi nozzle pressure)

Nozzle (No.)	Hose I.D. (Blast)			(Air Supply)	Optimum Vessel Size	Minimum Compressor Size (SCFM)	(HP)*	Approximate Blast Time (Min.)	Media Use (lbs/hr)
#2	1/8"	1/2"	3/4"		100 150	20	5	35 50	175
#3	3/16"	1/2 to 3/4"	1"		150 to 350	45	10	25 45	250
#4	1/4"	3/4 to 1"	1 to 1-1/4"		350	81	18	45	500
#5	5/16"	1 to 1-1/4"	1-1/4"		650	137	30.5	50	800
#6	3/8"	1 to 1-1/4"	1-1/2"		650 1050	196	44	35 55	1150
#7	7/16"	1-1/2"	2"		1050	254	56.5	40	1600
#8	1/2"	1-1/2"	2"		1050	338	75	30	2000
#10	5/8"	1-1/2"	3"		1050	548	122	20	3300

*HP: Use horsepower figures for reference only as actual air output may vary between compressors with the same horsepower rating.

Air Requirement & Media Consumption Chart

Nozzle Inside Orifice	PSI	Media Consumption (lbs/hr)					
		60	70	80	90	100	120
3/16"	Air (CFM)	30	33	38	41	45	--
	Horsepower	7.0	7.5	8.5	9.5	10.0	--
	Media (lbs/hr)	171	196	216	238	264	--
1/4"	Air (CFM)	54	61	68	74	81	97
	Horsepower	12.0	13.5	15.0	16.5	18.0	21.5
	Media (lbs/hr)	312	354	408	448	494	582
5/16"	Air (CFM)	89	101	113	126	137	152
	Horsepower	20.0	22.5	25.5	28.0	30.5	34.0
	Media (lbs/hr)	534	604	672	740	812	912
3/8"	Air (CFM)	126	143	161	173	196	220
	Horsepower	28.0	32.0	36.0	38.5	44.0	49.0
	Media (lbs/hr)	764	864	960	1,052	1,152	1,320
7/16"	Air (CFM)	170	194	217	240	254	300
	Horsepower	38.0	43.5	48.5	53.5	56.5	67.0
	Media (lbs/hr)	1,032	1,176	1,312	1,448	1,584	1,800
1/2"	Air (CFM)	224	252	280	309	338	392
	Horsepower	50.0	56.0	62.5	69.0	75.0	87.5
	Media (lbs/hr)	1,336	1,512	1,680	1,856	2,024	2,352
5/8"	Air (CFM)	356	404	452	504	548	611
	Horsepower	79.5	90.0	100.5	112.0	122.0	136.0
	Media (lbs/hr)	2,136	2,424	2,712	3,024	3,288	3,668

Media consumption rates, labeled as "Media (lbs/hr)" in the chart above, are based upon media having a bulk density of 100 pounds per cubic foot.

PERFORMANCE CHECKLIST ✓

Compare SuperBlast portables with any other blasters on the market today. The check-off list below shows why SuperBlast portables are the best buy in the industry. Empire invites you to make a point-by-point matchup.

	SuperBlast	Competitor
Vessel Construction & Loading		
Large (6-inch) opening for fast filling	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Automatic bag breaker to simplify loading*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Concave top for automatic refilling	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Built-in screen for lower profile, fewer clogs	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Filling height with screen (inches)*	_____"	_____"
Extra half-bag capacity for longer blasting	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ASME construction, National Board Reg.*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Transportation Features		
Tilt control for stability, easy mobility and no flat spots on tires*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Large, semi-pneumatic tires	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wide handle for stability while moving*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lifting eyes to simplify handling*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Invertible for transportation*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Streamlined control piping	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Front-mounted controls to prevent damage*	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Performance & Maintenance		
Large piping and valves to maintain operating pressure and increase productivity	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Flexible air line that simplifies maintenance and minimizes pressure loss	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Large access port for easy internal inspection and access*	6.5" x 8.5"	_____?
Moisture separator to prevent clogs and freeze-ups	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Grit Valve		
Provides straight-through media flow	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Has no metal surfaces exposed to grit	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Regulates all sizes and types of media	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Uses long-lasting, gum rubber pinch tube	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Convertible from manual to automatic	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Easy to repair in the field	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cost of grit-valve repair kit?	\$ _____	\$ _____
Approximate time to repair valve	15 minutes	_____?
Warranty	3 years	_____?

* SAFETY FEATURE

MEDIA GUIDE

	Glass Bead	Ceramic Shot	Stainless Cut Wire	Steel Shot	Steel Grit	Aluminum Oxide	Silicon Carbide	Garnet	Crushed Glass	Plastic Media	Agri Shell
Finishing	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
Cleaning/Removal	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Peening	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO
Surface Profiling (Etch)	NO	NO	YES	NO	YES	YES	YES	YES	YES	YES	YES
Working Speed	MED	MED	MED	MED	MED-HIGH	HIGH	VERY-HIGH	HIGH	HIGH	MED-HIGH	LOW-HIGH
Recyclability	HIGH-LOW	HIGH	HIGH	VERY-HIGH	VERY-HIGH	MED-HIGH	MED-LOW	MED	MED-LOW	MED	LOW
Probability of Metal Removal	VERY LOW	VERY LOW	VERY LOW	VERY LOW	MED	MED-HIGH	MED-HIGH	MED	LOW-MED	VERY LOW	VERY LOW
Hardness, MOH Scale (Rockwell RC)	5.5	7 (57-63)	6-7.5 (35-55)	6-7.5 (20-66)	8-9 (40-66)	8-9	9	8	5.5	3-4	1-4.5
Bulk Density (lb/cu. ft.)	100	150	280	280	230	125	95	130	100	45-60	40-80
Mesh Size	30-440	8-46	20-62	8-200	10-325	12-325	36-220	16-325	30-400	12-80	MANY
Typical Blast Pressures (psi)	20-55	20-90	20-90	20-90	20-90	20-90	20-90	30-80	20-50	20-60	10-40
Shapes: ▲ Angular; ● Spherical	●	●	●	●	▲	▲	▲	▲	▲	▲ or ●	▲

- Above information is intended as a general reference guide. Consult your authorized Empire distributor for specific media specifications.
- Sodium bicarbonate must be treated with a flow agent.

WARNINGS

- SILICA SAND IS NOT TO BE USED IN ANY EMPIRE BLAST EQUIPMENT**
- Before installing and operating any type of blast or safety equipment read all manufacturers' installation and operating manuals carefully.
- Always use "safety pins" when joining blast-hose and air-hose couplings.
- OSHA requires the use of operator safety equipment for all blasting operators. (Refer to Empire "Parts Book" for details.)
- All operator's breathing apparatus **must** be supplied with clean, breathable Grade "D" quality or better air as defined by the Compressed Gas Association Commodity Specification G-7.1, 1996.
- There are three safe ways to provide correct air quality to the operator:
 - An ambient air-breathing pump with a hood respirator
 - A self-contained air-respirator system
 - An air compressor equipped with a high-temperature alarm, carbon-monoxide filter, and a carbon-monoxide alarm
- The following precautions **must always** be taken when the operator is not separated from the abrasive air-blast process:
 - When using an air-supplied respirator, it must be attached to a "good" air source as outlined in items "5" and "6."
 - When supplying the respirator with an air compressor, a personal air filter must be installed between the compressor and respirator to remove oil and moisture. However, the air-filter **does not remove carbon monoxide (CO)**. The compressor **must always** be equipped with a high-temperature alarm, carbon-monoxide filter and carbon-monoxide alarm. Remember, carbon monoxide is an odorless, tasteless gas that kills without warning. Consequently, the monitoring and filtration equipment described above must be inspected and serviced regularly to assure safe operation.

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

WARRANTY: THREE YEAR LIMITED
 Consult Empire for details. For other literature or more information, consult your local Empire distributor, your Empire regional sales manager, or Empire company headquarters.

EMPIRE PRODUCTS

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