

Blast Cabinets

Equipment, Media Options Make Quick Work of Different Cleaning Needs

No two custom engine builders use the same team to create their engine products nor do they create the same engine or use the same parts. Just like each application has different design outlines so do abrasive blasting machines that are used to clean, strengthen, shot peen and rebuild custom engines for use in vehicles from fleets to racing.

Abrasive blasting technologies are nothing new. Years ago, military specifications were written and used to describe all the different types of abrasive blasting equipment. These specs were used by the Government to make sure any purchase was correct for the application and included both wet and dry blast cabinets, siphon, direct pressure, gravity feed abrasive delivery with specifications for light-duty and production models that needed to have first article inspection, making sure the machine was equal to its task.

These specifications still describe all the different models available today, but we also have new abrasives like soda, ceramic beads, tempered glass beads, plastic and others that use the same equipment modified for use with these new abrasives. Sometimes, just as with what happened with the advances of soda for blasting, this can create a new machine model specifically designed for one abrasive type. Adding words like “heavy-duty” to a blasting cabinet does not mean it’s a production blasting cabinet used with all abrasive types.

Custom engine builders all create different products – some need to shot peen parts in-house, some use steel shot to clean. Often older-

aged and harder castings are used that require cleaning and some new parts can be improved to make them even better, but the one common theme is the use of blasting cabinets. While they may be using different abrasives, different abrasive delivery models they all have some form of the equipment that best matches what they need for making their product.

Today’s Blasting Equipment

Today’s equipment selection for abrasive blasting cabinets is about the same as it has been for years. Even “back then” the field was broken into two types, stationary cabinet and portable blasting models. What has changed is mainly related to blasting cabinets and the dust collector design itself. Today, over half the cost of any production blasting cabinet can be in the dust collector itself. Why?

Many years ago, almost all blasting cabinets were wet models. It was easy to simply throw the abrasive into the water for total abrasive containment. This was before dry dust collectors and dry separator reclaimers were properly developed. The least expensive way to make a dry dust collector was to use a tubular sock and push air inside the sock. This took up a lot of floor space and did very little but filter. The comparison of this to an old tubed radio that took up lots of space and did very little is just too obvious to ignore.

Dust collectors and separator reclaimers that could work dry with abrasives as small as 25 to 50 micron as well as large steel shot were developed. This also opened the door to frictional heat that was significantly faster than wet models and made it easier to change abrasives and service. In addition to these advantages, dry media meant the part didn’t change to rusted orange before your very eyes.

The most important item on any dry blasting cabinet is the dust collector itself. This is very apparent when you see the high demand soda blasting has on the design of a soda blasting cabinet. Today, the dust collector can contribute more than 50% to the cost of the blasting cabinet as a complete machine.

Dust collectors changed from tubular dust bags to flat envelope dust bags allowing about 30 sq. ft. of cloth filter tube to become 100 sq. ft. of envelope cloth filter in the same space. Next came the filter cartridge that used the same space to house over 200 sq. ft. of filter surface. Because this was a rigid product it also allowed semi-automatic and automatic filter cleaning to develop, which replaced the so-called bed frame shakers you might have found in a Route 66 motel.

Today, we have progressed to pneumatic vibrator cleaning cycles, automatic-timed reverse pulse cleaning that cleans during machine



Before and after soda blasting tells a compelling story – but be aware that that story isn’t necessarily the same for every engine builder. Your needs may vary. Photo courtesy of ARMEX.

operation, eliminating the need to turn the machine off for a dust collector cleaning cycle. Compare your cleaning equipment to a car: you can have the fastest car in existence, but if you can't make a fast pit stop and perform maintenance quickly you do not have a race car, only a fast car. Production blasting cabinets need a dust collector that is easily serviced, self-cleaning or semi self-cleaning with lots of dust storage filter area or you just have a blasting cabinet.

The application should be what drives any budget and not the budget that should drive the application. Always make sure the gun size is matched to the available compressed air volume, the dust collector and to the daily operation if you want a satisfactory blasting cabinet that operates day after day, month after month and year after year.

What happens if the gun CFM size, the dust collector, condition of the part, delivery method (siphon and direct pressure) and daily machine operation are not matched to the user's application? Most likely, failure. The equipment may be perfect for another application so it's often not the fault of the equipment, but the wrong equipment was purchased for the right application. Too many times, budget is driving the purchase so the machine may be set up to fail.

Many applications today require a large free standing dust collector because the application may require multiple shifts or multiple guns to be in operation. A single production gun can move 600 pounds of abrasive per hour, 4,800 pounds per day and 1.25 million pounds per year on a single shift. You can only attach so many self-contained dust collectors to any cabinet before it makes more sense to attach the cabinet to the dust collector. Freestanding central dust collectors are often required but this can also get lost in budget numbers.

Why The Right Machine Matters

Shot peening (different from shot cleaning) will occur with almost any type of blasting equipment using glass beads to stainless steel shot and siphon to direct pressure delivery. As the air volume quantity used and the velocity of the round ball increases as well as the shot size, the part actually gets stronger.

You can push on glass and it will actually bend unless you scratch the surface – if the surface fails so does the part! Would you want to fly at 30,000 feet in a commercial jet aircraft using engine blades shot peened with a small inexpensive siphon cabinet purchased online?

Knowing what makes a part the strongest, knowing why you would use a wet machine over dry and knowing when siphon is better than direct pressure or visa-versa is required to make sure any custom engine builder gets the right machine the first time.

Each blasting machine abrasive delivery type has its own best application and using only one type for all blasting means the application may be a compromise. While this may be OK sometimes it may also be less than perfect.

Where Are We Going With Innovation?

New problems are always being created and new solutions are constantly being developed in the abrasive blasting field both for portable and cabinet-type equipment.

Soda is one of the newer, more popular abrasives. Water-soluble and rated at 2.4 on the Mohs Scale of Mineral Hardness, it ensures that



Select the equipment you use by the cleaning needs you have, not the budget you think you can work within today. Photo courtesy of ARMEX.

a surface does not change and the abrasive does not stick in the part after cleaning. This is key to helping eliminate part work hardening and surface change during the cleaning process.

Dry lubrication is another fairly new blasting application that is starting to be more well-known. Blasting equipment is first used to prepare the surface and next used to embed a special material into the surface to eliminate other standard methods of lubrication.

Yesterday's walnut shells have become today's plastic abrasives that clean colder and faster than high frictional heat-cutting abrasives all without changing the part's metallurgy. Unlike walnut shells that contain oils that can create painting problems, plastic abrasives are available in many different hardnesses for an exact application fit.

Chemical cleaning creates waste problems and abrasive blasting does not, so many applications today are returning to blasting as the solution to cleaning problems.

Blasting equipment is something everyone knows about but few really understand. Because production cabinets are more expensive, often they are not considered "affordable." However, doubling the gun's size triples the production and sometimes squares the production. Spending \$3,000-\$5000 more on equipment can easily get you nine times the production saving on labor dollars and business expenses by blasting nine parts in the same time as one. At year's end, the extra purchase cost may be the biggest bargain missed because a limited budget precluded a possible \$100,000 savings.

Each shop has its own applications that will determine the most efficient blasting cabinet configuration, if you don't know and understand all the different types of blasting equipment, always look for a company that offers more than one or two different sized cabinets.

Knowing what's on the horizon comes from you, the user, talking directly with the manufacturer when an application just might work. The end user is the new innovation engine that drives our market and industry. Today, you are seeing dustless, portable blasting, CO2 blasting that simply evaporates, cold blasting, soda blasting and dry lubrications that develop new year after year. If you can get past the marketing seller and talk directly to the manufacturer, you can learn information about any application you might have.

The type and number of engines being built can determine the best machine configuration, and while "One Size Fits All" can be great for t-shirts and ballcaps, "three tools in one" often means all of the options are over-rated and not really that great. ■

Thanks to Brian Waple of Armex, Mike Hazelkorn of the Rochester Institute of Technology's NCR3, Clemco Industries, Viking Blast & Wash and Media Blast and Abrasives for research, consultation and contributions to this article.

Is Non-Destructive Cleaning Critical?



ARMEX Is The Only Choice

When cleaning parts that cannot have the specifications or surface tolerances change, the only blasting abrasive to use is ARMEX. Other hard blasting abrasives can remove surface materials, damage threads and change the specifications along with surface tolerances rendering the parts unusable.

The gentle physical propriety of baking soda but yet aggressive cleaning ability is what makes ARMEX the only choice. ARMEX is environmentally-friendly and soluble. It can dissolve in water, oil, antifreeze and transmission fluid. Because ARMEX is soluble it will never leave blasting particles behind in critical or hidden passageways like other hard blasting abrasives which can increase the risk of parts failure when placed back into service.

Use ARMEX to clean, de-grease, remove burnt on carbon and paint on a wide variety of materials including steel, aluminum, lead, alloys, plastics, rubber and composites.

ARMEX for When Non-Destructive Cleaning is Critical.

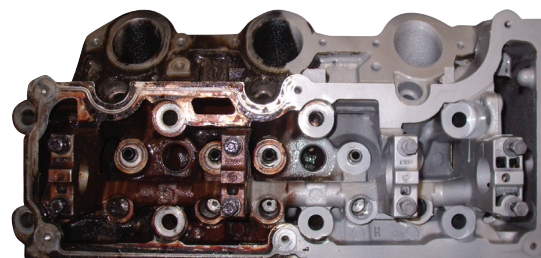
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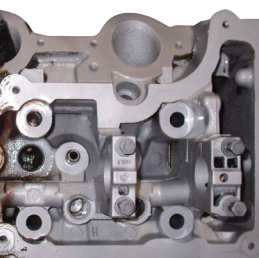
Before



After



Before



After



Before & After