Sandblasting 101

The Basics of Sandblasting

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Sandblasting 101:
The Basics of Sandblasting

Thank you for downloading my free ebook! I hope you enjoy this quick guide and that it is helpful.

I created this after having many of my subscribers asking some of these basic questions.

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The only thing I ask- is that you provide me credit with a link back to my website (http://www.sandblasterinfo.com) and to not edit this file in any way. Thank you!

Whether you are new to sandblasting or want to learn more about it, I think this is a great start for you. Feel free to ask me other questions by email through my website.

This guide explains all the different types of sandblasters to help you decide what you need and it shows sources of where you can buy them. It also explains how to operate the two most common sandblaster types called the siphon and pressure pot.

The last section explains the different abrasive types, the grit sizes, and what type should be used for different applications.

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Introduction

To start out the ebook I included sections on how a sandblaster works with steps to turning it on since many people want to know this. The beginning sections explain how to operate the two most common types which are the siphon and pressure pot sandblaster.

Siphon Sandblaster

The siphon sandblaster is used more often because it is usually cheaper. The bad thing about these is that they aren't as powerful and use a lot of air which usually requires a bigger air compressor.

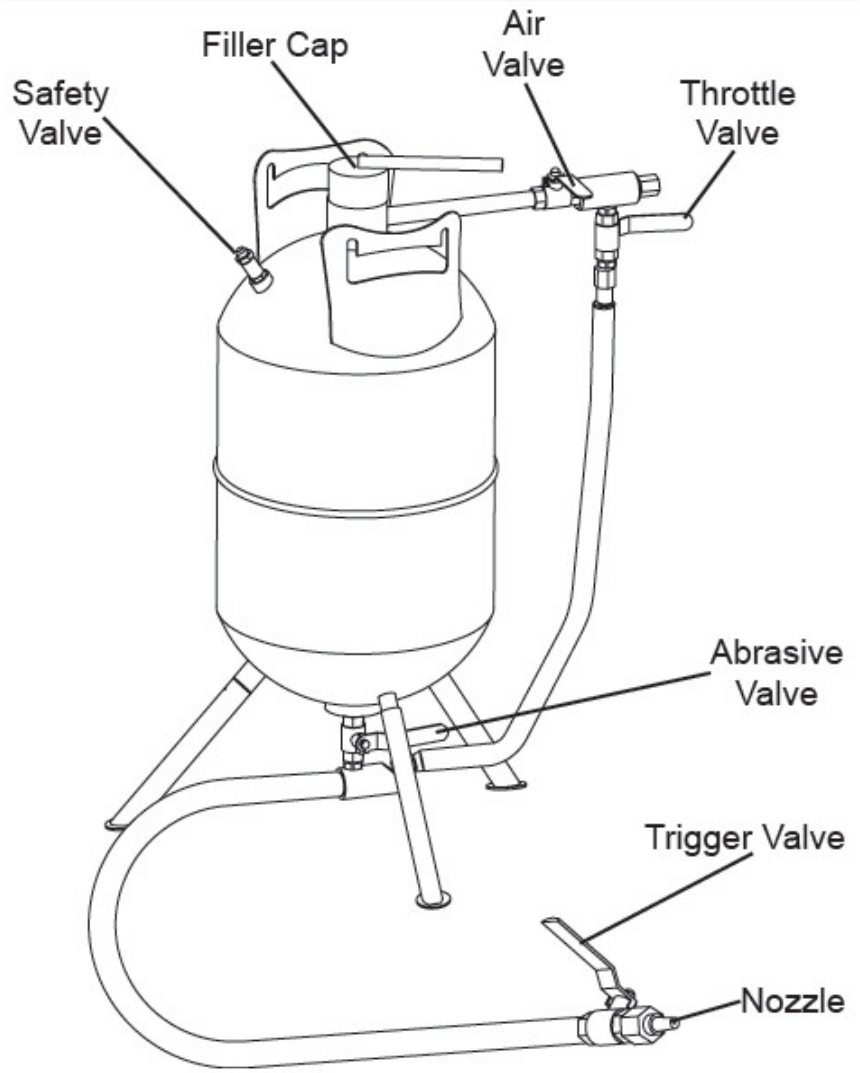
Pressure Pot Sandblaster

The pressure pot sandblaster is more much more efficient, has a stronger blasting pressure, and uses less air so the air compressor is more likely to keep up. These are just some of the reasons professionals prefer to use the pressure pot.

How a Pressure Pot Sandblaster Works

Typically on the pressure pot sandblaster main body, there are 3 different valves to operate and adjust. The top two directly deal with only the air and the bottom comes in contact with the abrasive & air.

Some people call these valves different names and I even name them a little bit different in my ebooks and plans. For the sake of consistency, I will name these the same as another manufacturer calls them.



Top Valves
As shown in the photo, the "Air Valve" and "Throttle Valve" are the top two. Their purpose is explained below:

- **Air Valve**- Opens and closes air flow into the tank. This is meant to be opened fully when in use.
- **Throttle Valve**- Adjusts the amount of flow down to the Abrasive Valve. This valve is meant to be only partially opened.

Bottom Valve
The bottom valve is called the "**Abrasive Valve**". This valve is supposed to be turned only to the full open or fully closed position. The reason is because the abrasive flow can deteriorate the valve if it is partially open. Although it isn't meant to be partially open, it usually doesn't deteriorate very fast and I always open it about 50%.

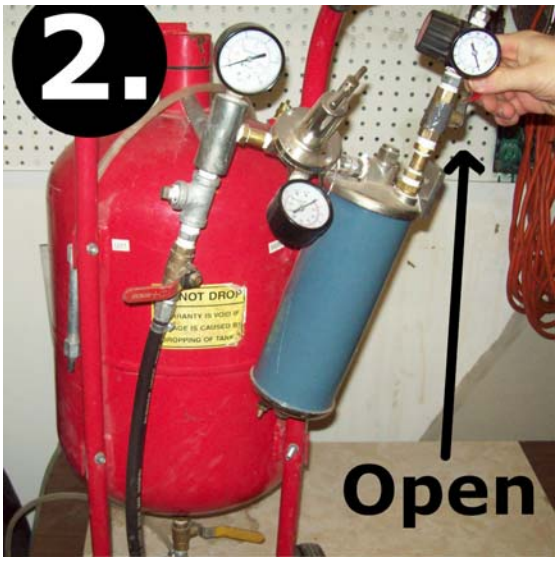
If it is opened too much, the abrasive will often be too much for my preference.

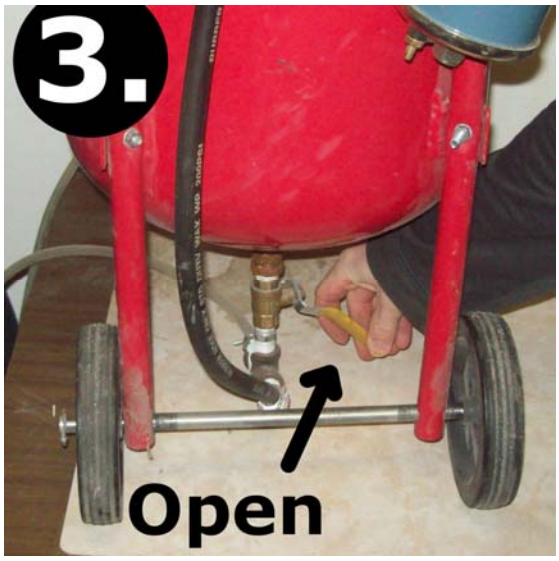
How to Operate the Pressure Pot
Listed here are the steps on how to operate the pressure pot. You can see the photos below that which depicts these steps.

1. **Valves Closed**- When starting out, all the valves should be in the closed position.
2. **Air Valve On**- Then connect the air hose and open the Air Valve so that the tank fills up with air. You will hear it filling up within 30 seconds to a few minutes depending on the size.
3. **Abrasive Valve On**- As I stated before, you are suppose to open the Abrasive Valve so it is wide open, but I turn this valve so that it is about 1/3 to ½ way open so it limits the amount of abrasive being delivered to the nozzle.
4. **Nozzle/ Trigger Valve On**- Aim the nozzle at your object and open it so that is completely on which is usually using a Trigger Valve. Abrasive will start shooting out. Right after abrasive comes out in an almost simultaneous fashion; turn on the next valve described next. (You may prefer to open both of these at the same time.)
5. **Throttle Valve Slightly On**- Immediately crack open the Throttle Valve and adjust until you get a preferred abrasive to air ratio.

Note: the Throttle valve has to be opened less than the Abrasive Valve so that the higher air pressure flows through the tank and pushes out the abrasive. I believe this may be some of the problems people are having when the abrasive doesn't come out.

The abrasive adjustment will lag and manufacturers suggest that it can take a minute until fully stabilized to your setting.





How a Siphon Sandblaster Works

How to Operate the Siphon Sandblaster
The siphon sandblaster actually varies by design and for the most part turning it on is common sense, but this section describes how it operates.

Siphon systems typically have two different hoses going to the nozzle. One hose directly connects the compressed air to the nozzle. The second hose connects to some sort of abrasive holding tank or hopper which typically isn't an enclosed area. Most sandblast cabinets already have the siphon system installed.

How it operates as described below:

1. Make sure the tank hopper is filled up with abrasive and the abrasive tube from the nozzle is stuck in the abrasive media; usually at the very bottom. Some people call the end of this tube the pickup tube which has a piece of metal at the end of it to jab into the abrasive pile.
2. Connect the air hose line to the nozzle with the air tool coupler and fitting.
3. Press the trigger which will allow air to flow out the nozzle. Within a second or two the air flowing out of the nozzle creates a vacuum which siphons the abrasive from the other (abrasive) tube and mixes in with the air.
4. Then it simply blasts out the nozzle. Aim & blast!

Types of Sandblasters

There are a few types of sandblaster categories but even more types within those categories with different designs and sizes.

These are the main sandblaster category types at a quick view:

- Siphon Sandblaster
- Pressure Pot Sandblaster
- Wet Sandblaster
- Soda Blaster

Sandblaster Types In Depth

To explain these further, I created a more in depth list below which also discusses all the subcategories available within these main category types. Links are included to a few sources also.

- **Siphon Sandblaster-**
  - **Traditional**- The typical type simply has a pile of abrasive which is siphoned out from a pickup tube the nozzle. The pickup tube can be either placed in a bag of abrasive or is fixated at the bottom of a sandblast cabinet.

Sources
Siphon Cabinet system: http://amzn.to/19t71fk
Pickup tube siphon kit: http://amzn.to/SQcRis

- **Gravity Feed**- The only difference here is that the abrasive is located above the nozzle. These work much better because gravity is helping to force the abrasive down into the nozzle. With gravity feed sandblasters you are also less likely to have abrasive flow problems because the abrasive is contained better toward the point of exit. Most of these are handheld units but you can also place a large hopper above and connect a nozzle to it with a hose. You can get creative with this idea and rig something up.

Source: http://amzn.to/UMosEH

- **Mini Units**- Most of the small sandblasters available are siphons but there are some that are pressure pots also. I wrote plans on how to make a mini pressure pot on my website. Many of these are also gravity feed sandblasters but the traditional design is sold also. They are also commonly called pencil sandblasters.

Sources
Gravity Feed Mini Sandblaster: http://amzn.to/1cya4Hw
Make a Mini Pressure Pot Sandblaster:
http://www.sandblasterinfo.com/sandblaster-manual/mini-plans/
Lists of Other Minis: http://www.glassetchingsecrets.com/blog/mini-sandblasters/

- **Pressure Pot Sandblaster-**
  - **Shop Sized**- Essentially the only different thing between these are the sizes available. The typical shop sized ones used are the 20 lb, 40 lb, or 110 lb tanks which indicate how much abrasive it can hold by weight.

Source
20 lb Pressure Pot: http://amzn.to/19gK2cy

40 lb Pressure Pot: http://amzn.to/19t9wOw & http://amzn.to/1dj2vGB

Larger sizes: http://amzn.to/1eaErUJ , http://amzn.to/1evbDo0 , http://amzn.to/T5hrwc

  - **Large Sized**- You can buy larger industrial sizes or even make them from larger propane tanks as described in my plans. A lot of people that sandblast for a living will have these large sandblasters attached to a trailer with there own large air compressor run by a gasoline powered car engine.

- **Cabinet Pressure Pot**- Some manufacturers actually make cabinet systems directly connected to the pressure pot. These types are a little less common because they are very expensive, but they are very nice setups because the system automatically recycles the abrasive back into the tank for you! It is very possible to make one of these yourself.

I have seen two different designs for how these work. The one type has the pressure pot welded directly under the cabinet so that all the abrasive funnels down to where the fill up port is. When the air pressure is turned off, the depressurized tank allows the plug to drop so the port opens and the abrasive pours into the tank.

The other type I have worked with operates in a similar way, except it uses a large vacuum to suck the abrasive from the bottom of the tank to the sandblaster which also works as the dust collector.

- **Wet Sandblaster**- Sandblasting with water is a great way to keep dust down to a minimum. Even though it is messy, it is well worth the effort by removing dust which also causes lung problems.

- **Pressure Washer Blasters**- These work in a similar way as the siphon sandblasters except they use a pressure washer with a special attachment to force water out of the nozzle while simultaneously siphoning the abrasive out from another bottle.

Source
Attachment Kits: http://amzn.to/13JzBJl & http://amzn.to/1dYU6Do

- **Traditional Wet Blaster**- These have been around for quite some time. It is essentially a pressure pot blaster with a water fed hose connected at the end of the abrasive nozzle which sprays a light amount of water in mist form internally or externally after it exits depending on the product. Clemco makes an attachment which can be connected to any sandblaster.

Source
Clemco external attachment:
http://www.clemcoindustries.com/products_showitem_clemco.php?item_id=02701

- **Dustless Sandblaster**- These are a little bit newer to the industry which are also called “Slurry blasters”. Most people call them dustless sandblasters after the company that started marketing them. If you look at them, they essentially look and work similarly to the pressure pot sandblaster except the inside design is different. Unlike the traditional wet blaster, these units actually have the abrasive and water mixed inside the tank.

- **Soda Sandblaster**- These are usually similar to the pressure pots, but some are designed like the dustless sandblasters. They are used a lot for blasting softer items to prevent sheet metal from warping and pitting since the sodium bicarbonate abrasive is soft.

  - **Top Exited Soda Blaster**- Most of the soda blasters I see are built so that the soda media exits out of the top. I believe this is designed so that the flow is better. There are many different sizes available also.

Source
40 lb soda blaster:
http://amzn.to/1cHL4g2

Larger sizes:
http://amzn.to/1aLlof6 ,
http://amzn.to/1cHM1VI ,
http://amzn.to/1aLlDa3

Smaller size:
http://amzn.to/1iX6Cdn

  - **Soda Blaster Kits**- There are also kits available that hook up to any typical pressure pot which exit out of the bottom of the tank. I don't know how well they work, but these can be made easily or purchased.

Source
Eastwood Kit: http://amzn.to/Ui4Ng3

Abrasives

The first type of abrasive many newcomers typically think of using is play sand, but it should not be used.

It is understandable that people think this is what is suppose to be used because the word “sand” is in the name sandblasters. Some suppliers are even renaming their equipment “abrasive blasters” so there is no misunderstanding that sand shouldn’t be used. This is a good idea on their part, but since the word sandblaster is most often used, I tend to term it that.

Why Sand Should Not Be Used

The main reason sand should not be used is because it is made up silica. When abrasives that contain a lot of silica are blasted against objects, they will break apart and emit dust which contains silica. When this silica dust is inhaled, it causes a very serious lung problem known as silicosis. Silicosis can cause breathing problems and eventually lead to death. That is the main reason play sand is not used.

Using play sand or any type of sand in blasters is also against OHSA rules in the United States. If you buy play sand by the bag from stores, you will often notice the bag saying not to use it for blasting.

Some people are still stubborn enough to use play sand because it is one of the cheapest abrasives to buy. But when you look at the facts at how many times it can be reused, you aren’t really saving that much money. Play sand breaks down much quicker than blaster recommended abrasive such as aluminum oxide. So even though recommended abrasives such as aluminum oxide are much more expensive, they can be reused many times over again. Play sand can only be reused a few times, while it has been said that aluminum oxide can be reused up to 70 times.

Do not use sand for your blasting! I am dedicated to educating people on this because I don’t want people to develop serious health problems. It is much better to spend 10, 20, or even 100 dollars more for quality abrasive than to risk your health to save a few bucks which may end up costing you thousands or even 10’s of thousands of dollars for medical bills in the future.

Types of Abrasive Used in the Sandblaster

First I want to list some of the common types of abrasive used for sandblasting, then I will discuss what type should be used for different applications.

You should also know that abrasives are usually categorized by hardness using the Mohs scale with 1 as a soft material and 10 as a hard. The abrasives below are listed by hardness.

Soft Abrasives

- Sodium Bicarbonate (aka baking soda): 2.5 Mohs
- Walnut Shells: 3-4 Mohs
- Plastic Media: 3-4 Mohs
- Corn Cob grit: 3-4.5 Mohs

Medium Abrasives

- Glass Beads: 5.5 Mohs
- Crushed Glass: 5.5 Mohs
- Coal Slag (common brands are Black Beauty & Black Magnum): 7-7.5 Mohs
- Garnet: 7.5 Mohs
- Steel Shot: 8 Mohs
- Steel Grit: 8 Mohs

Hard Abrasives

- Aluminum Oxide: 8-9 Mohs
- Silicon Carbide: 9-10 Mohs

Abrasive Grit Sizes & Types for Different Applications

I frequently get asked by many visitors that come to my website what types of abrasive they should use. This is a tough question, because it can vary by the type of material being blasted and what application is being blasted. Then it is also a preference for that person depending on how much they are willing to spend, how often they will reuse it if at all, and what is available to them.

Choice of Grit Size

It even gets more complicated when looking at the grit size. A course grit will typically clean an object faster than a fine grit, but is also more likely to cause pitting which digs into the object's surface being blasted.

Grit size or mesh is a term used for the measure of how fine or coarse the abrasive media is. A larger grit number means it is finer such as 600, while a smaller grit means the abrasive is coarser such as 50. Basically, as the grit number gets larger, the abrasive particles become finer.

See the table below for an example and representation of some grit numbers. For creating a smoother surface, a finer grit size is used but it is usually more expensive than a coarse grit size.

(Chart numbers do not represent the extreme values available in the marketplace. Numbers used are for example purposes only.)

Grit	Measure
50	Coarse
100	Finer
600	Finest

Some abrasive types such as coal slag will use different numbers like 12/40. This essentially means the sieve size for a bag of the abrasive can vary from 12 to 40 grit. It is very hard to get every particle the same size so they use a range.

You still might wonder why other types of abrasive like aluminum oxide has a sieve range size also, but use stand alone single number such as 100 grit. I contacted an abrasive distributor and they told me it is because aluminum oxide users go off a tight sieve specification.

Applications

Sandblasting is used for all types of things from dentistry to car restoration. Some of the common uses for sandblasting are:

- **Dentistry cleaning** for prosthetic & orthodontic devices, and even teeth cleaning!
  - Use soft abrasives
- **Concrete cleaning** to remove graffiti and various grime
  - Use soft to light medium abrasives
- **Building & sculpture cleaning**
  - Use soft to light medium abrasives
- **Industrial equipment cleaning**
  - Use soft to hard abrasives
- **Car restoration** to remove old paint and rust to bare metal
  - Car frame can use soft to hard
  - Car body should use soft or medium with wet blasting
- **Precise cleaning** such as carburetors, engine blocks, electric devices
  - Use soft abrasives
- **Peening** of precise parts for aircraft engines, gears, etc..
  - Use medium abrasives only in shot or bead form
- **Bridge cleaning**
  - Use Medium to hard abrasives
- **Log cabin cleaning** to clean outside surfaces
  - Use soft to light medium abrasives.
- **Glass etching & glass carving**
  - Use hard abrasives
- **Stone carving**
  - Use hard abrasives
- Etc…. I can go on and on!

Applications to Note

As noted in the above, I listed the range of abrasives that are typically used and can be tolerated for those applications. For this section, I'd like to explain a few other things that you should know.

Soda blasting and other soft abrasives is commonly used for cleaning all parts of a car restoration from engine parts to the body because it does not pit into the metal and does not produce a lot of heat.

Since the chassis has thick metal and isn't a precision item of the car, this can use hard abrasives to clean it quicker. The body should not use hard abrasives because it can pit into the metal and create a lot of heat which warps the thin sheet metal. However, if you use wet blasting, the water will cool down any heat so a lot of car restorers will use something like crushed glass with water.

Shots/ Beads vs. Grit

Many types of abrasive with have different types known as shot, bead, or grit. Abrasives that are shot or bead are similar types with a more circular shape and may cost much more. They are commonly used for finishing, deburring, and peening in addition to surface cleaning.

Grit on the other hand is a more angular abrasive type with a sharper edge which may clean items faster but are also more likely to cause pitting.

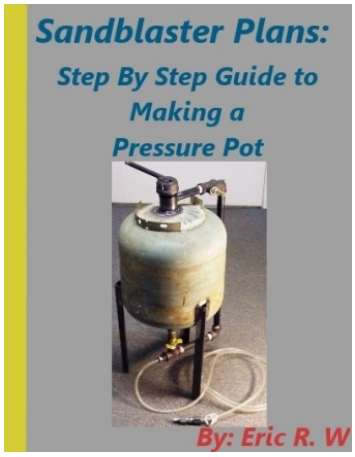
A good example of this is glass bead verses crushed glass which is considered more of a grit. Crushed glass is much cheaper!

Other Information!

Sandblasting equipment can be expensive, but there are other ways around these high prices. I have been making all kinds of my own equipment inexpensively and it is sort of fun making this stuff.

I even wrote plans documenting all the steps, where to get parts, and how some of these sandblasters work.

Make Your Own Sandblaster



If you want to make your own sandblaster, my plans here (http://www.sandblasterinfo.com/sandblaster-manual/plans/) show to make it out of a old propane tank safely and easily. Plus, it explains how to make my unique and inexpensive nozzle set up which allows you to actually adjust the amount of abrasive flow from your finger tips.

It also includes the following bonuses:

1. **Finding the Right Compressor Guide**
2. **Air compressor Types Guide**
3. **New Abrasive Problems Guide**
4. **Sandblasting Safety Guide**

On- Site Sandblaster Attachment

As an alternate to wet blasting for preventing dust, I created my own attachment which sucks all the dust out directly after abrasive impacts the surface. They typically call these On-site sandblasters which can cost thousands of dollars. These are easy to make and work great to prevent abrasive and dust from getting all over.

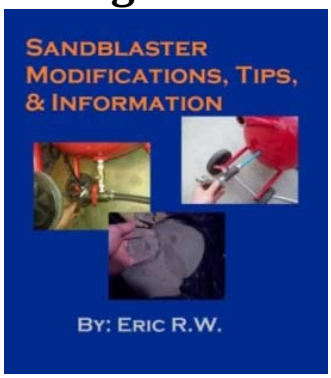
I create the plans here:
http://www.sandblasterinfo.com/sandblaster-manual/on-site-plans/

Mini Sandblaster Plans

I often need a mini sandblaster for small projects and use it for smaller items requiring fine abrasive. Since most mini sandblasters are only siphon powered, I decided to make my own out of a torch or camping propane tank so it has the power of a pressure pot.

These are designed completely differently with a unique internal structure. I documented exactly how to make them in my plans below: http://www.sandblasterinfo.com/sandblaster-manual/mini-plans/

Fixing Abrasive Clog & Flow Modifications



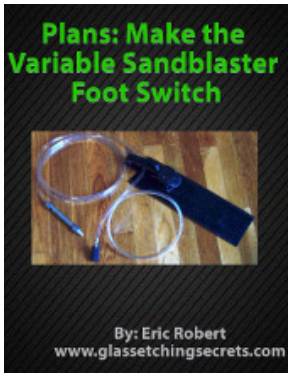
This is one of my most popular plans which show a unique way to fix abrasive clogs and flow problems that many people experience with sandblasters. It includes steps on how to modify it and suggestions to keep the abrasive consistently moving through the blaster.

You can get these here:
http://www.sandblasterinfo.com/sandblaster-manual/

It also includes the following bonuses:

1. Multiple different sources to get inexpensive pressure pots at different sizes.
2. How to easily make them from an okay piece of equipment to a great smooth flowing sandblaster.
3. Low cost sources for add-on appliances such as an dead man valve.
4. Guide to other creative things you can do with your pressure pot.

Variable Sandblaster Foot Switch Plans



This is the latest creation that I thought of which shows how to make a unique foot control switch which both easily adjusts the abrasive flow for varying the pressure and operates as the on/off switch.

Since I blast small to medium sized objects in a cabinet, this foot switch has been my favorite nozzle set up to use since I designed it. I still use it to this day!
You can learn more about it here:
http://www.glassetchingsecrets.com/shop/vari-blast-footswitch-plans.html

Thanks!

As always, I appreciate you taking the time to read this and check out my site. It means the world to me!

Always feel free to check back at my site and blog here http://www.sandblasterinfo.com/category/sand-blasting-news/ from time to time to get updates on sandblasting information.

Feel free to email me through the site and ask me any questions also. Thanks!

Remember to Pass This Ebook On

As I stated before, you may share this ebook with other people.

-Eric R. W.

http://www.sandblasterinfo.com/