Sand Carving

SWAT.hockenbery.net

Sand carving is both simple and complex

The whole process can be as simple as cutting a square of resist, sticking it on a turning and blasting the uncovered surface and removing the resist.

The myriad of choices may seem complicated:

- Selecting numbers and sizes of images
- Detail level of images
- Positive or negative space blasting
- The spatial relationship of images
- Blast media choice
- Multiple surface preps and treatments

Each individual step is easy to master.

Equipment and Supplies

Essential Equipment

- Compressor 27 gallon
- Sandblast cabinet- HF
- Dust mask n100 or p100
- Eye and hearing protection

Nice to have

- Vinyl cutter – Titan 15"
- Computer with photo editor
- Compressor 60 gallon or larger
- Airbrush
- Pressure pot – ALC
- Foot switch – my next acquisition

Essential Supplies

- Blast media – coarse ground glass
- Sandblast resist- Anchor BlastLite™ Stencil #T226, 22 mil
- Exacto knife

Nice to have

- Transfer tape- ORATAPE HT55 High Tack
- Air brush paints
- Spirit stains
- Leather dye

Safety

- Sand blasting done improperly can cause many respiratory diseases.
- Inherent in the process you will create wood dust and abrasive dust.
- Research abrasives. Avoid carcinogenic and toxic blast media.
  I use coarse ground glass but I don't want to breathe it.
- Source containment is number 1 and easy with a blast cabinet. A cabinet will trap all the small particles. Connect it to a dust collector
- Wear a respirator rated n100 or p100
- Some dust will be in the cabinet when you open it and on your piece when you bring it out of the cabinet.
- Removing the media from the cabinet creates a lot of dust. Be vigilant.
- Don't clean up with compressed air; it just puts dust in the air. Use a shop vac or small brush.

What ESCALAST.COM has to say about ground glass

100% recycled glass eliminates the health risk of airborne carcinogens. It is non-hazardous, non-toxic and completely inert, so is safe to use around water. Glass dust is classified by OSHA/NIOSH as only "nuisance" dust because it contains less than 1% free silica. Glass also does not contain virtually any of the OSHA identified Heavy/Toxic Metals associated with slags and some other mineral abrasives like natural olivine. Lastly, since glass is translucent, visibility and productivity are significantly improved when compared to a blast environment using traditional hard abrasives.

Recycled bottle glass is chemically known as Amorphous Silica. Free-silica is commonly found in traditional blasting sand and other hard abrasive sandblasting medias. Silica-sand dust in its natural state has an "open"crystalline structure that has the capability of sticking to lung tissues. When this happens, the likelihood of developing a serious respiratory disease called Silicosis increases. Because our recycled glass blast media is amorphous, its crystalline structure is "closed", which makes it impossible to physically stick to human lung tissue. When a person is exposed to amorphous glass fines or dust, the body will expel the dust as it would any other type of natural dirt.

Steps from vision to completed work

Image artwork

- Make or find image
- Convert to B&W in photo editor
- Refine lines and size in photo editor
- Cut the images and weed the waste

Turned form

- Choose wood – consider the blasted area look
- Turn form
- Plan layout and numbers of images
- Create the surface you want in the resist covered areas
- Apply finish, paint, stain, dye etc

Sand carving

- Make any alignment marks with watercolor pencil you know will come off with water
- Apply the resist Images
- Squeegee the images in place
- Do the sandblasting
- Apply any finish/color to the blasted area using the resist to mask the unblasted areas
- Remove the resist
- Remove any adhesive

So many choices

1. Blast the positive or negative space?
   - I usually blast the negative space and use a positive image as a mask
   - Glass carvers usually blast the positive space giving a frosted look by covering the negative space with mask the has a cutout of the desired image
2. How to finish the wood to be covered by the mask?
   - Raw from the tool – not usually a good choice
   - Sanded
   - Color with paint, stain, or dye
   - Film finish
3. How to finish the blasted surface?
   - Color using the resist as a mask airbrush paint, stain, or dye
   - Spray with a fixative
   - Any film finish

Resist

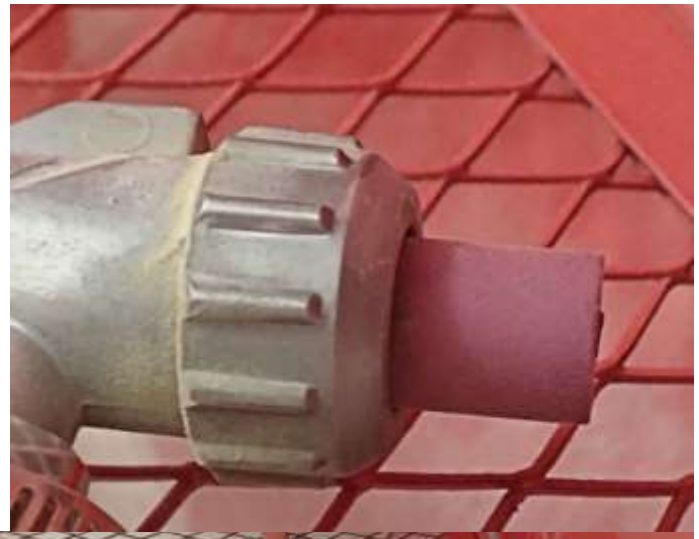
- Resist blocks the media and can be as simple as a twist of wire around a pen barrel to make a spiral when blasted.
- Electrician's tape can serve as a resist. It takes a while for the media to eat through it.
- I like the Anchor BlastLite™ Stencil. It is easy to cut, holds onto wood well, stretches and compresses to conform to round shapes
- When removed there is some adhesive residue. This can be removed by dabbing with a scrap of the adhesive material.

Blast media

- Ground glass and glass beads are good choices for woodturners.
  - Coarse ground glass (25-40 grit) has a good aggressiveness for most woods
  - Beads offer less aggressiveness available in extra coarse(50-70 grit), coarse(60-120 grit), Medium(70-140), fine(100-170 grit), extra fine(170-325)
  - Not known to pose a health hazard and does not contain any free silica
  - Can be reused as many as a dozen times
  - Does not tend to imbed itself in wood
- Aluminum oxide
  - Available in a wide range of grits
  - Usually contains a small amount of free silica
  - Can be reused

The blasting

- I use a 1/8" nozzle
- Hold the gun about 4" from the wood and no closer than 2 inches
- Keep the gun vertical to the wood you don't want to blast under the edge of the mask and lift it up
- Use a back and forth motion like spray painting – don't dig a hole
- I generally follow the outline of each image to cut a clean outline and then blend the areas between images.
- Watch and adjust as you go



Wood choices

- I always experiment with woods I haven't blasted before.
- Hardwoods with little visible grain like citrus and eucalyptus blast with a sort of pebbly texture
- Woods like cherry and camphor show grain patterns on the side grain and a pebbly look on the end grain
- Woods like chinaberry and Douglas fir have a hard and soft part in the growth ring. Sand blasting erodes the soft part leaving the hard part. This creates deep grooves in thicker pieces and pierces the walls of thinner pieces.

Design considerations - two box lids

Grain alignment
with image

Coarse ground glass
blast media
25-40 grit

Extra fine glass
bead blast media
170-325 grit

Fonts, sizes, &
orientation

A simple sand carving

1. Use exacto to cut four dragonfly wings and one dragonfly body from a sandblast stencil. These can be done free hand or by sketching the outline on the resist.
2. Prepare the surface of the turning.
3. Stick the resist on the form.
4. Blast the background holding nozzle 2-4" from and perpendicular to the surface. Keep the nozzle moving a bit like spraying a finish.
5. Apply finish to the blasted area.
6. Remove the mask.
7. Remove any adhesive left on the dragonflies. Dab the residue with a scrap of resist to pull it off the wood.

Frog's Night Out series

Inspired by porch light gatherings of tree frogs

Here is where it helps to have a vinyl cutter. A page of weeded frogs looking for a vessel to sit upon.

One of the vessels has over 30 frogs on it.

15 different frogs. From two crawling frog images I manufactured 12 different frogs by making 3 sizes of each and mirror imaging each. I also have 3 frogs I used a single image of.

To get a sort of randomness to the frog I used some simple rules.

Scatter the single image frogs somewhat evenly. The put larger frogs on, place some close to each other and some as singles. Fill in with the smaller frogs. Try not to put similar ones close to each other and if you must face them in different directions.

Brightest frogs are achieved with green spirit stains and black airbrush paint.

Process

Hollow form sanded, stained, and coated several times with Waterlox

Tadpoles for inside printed on paper to confirm size, spatial arrangement, and grain alignment

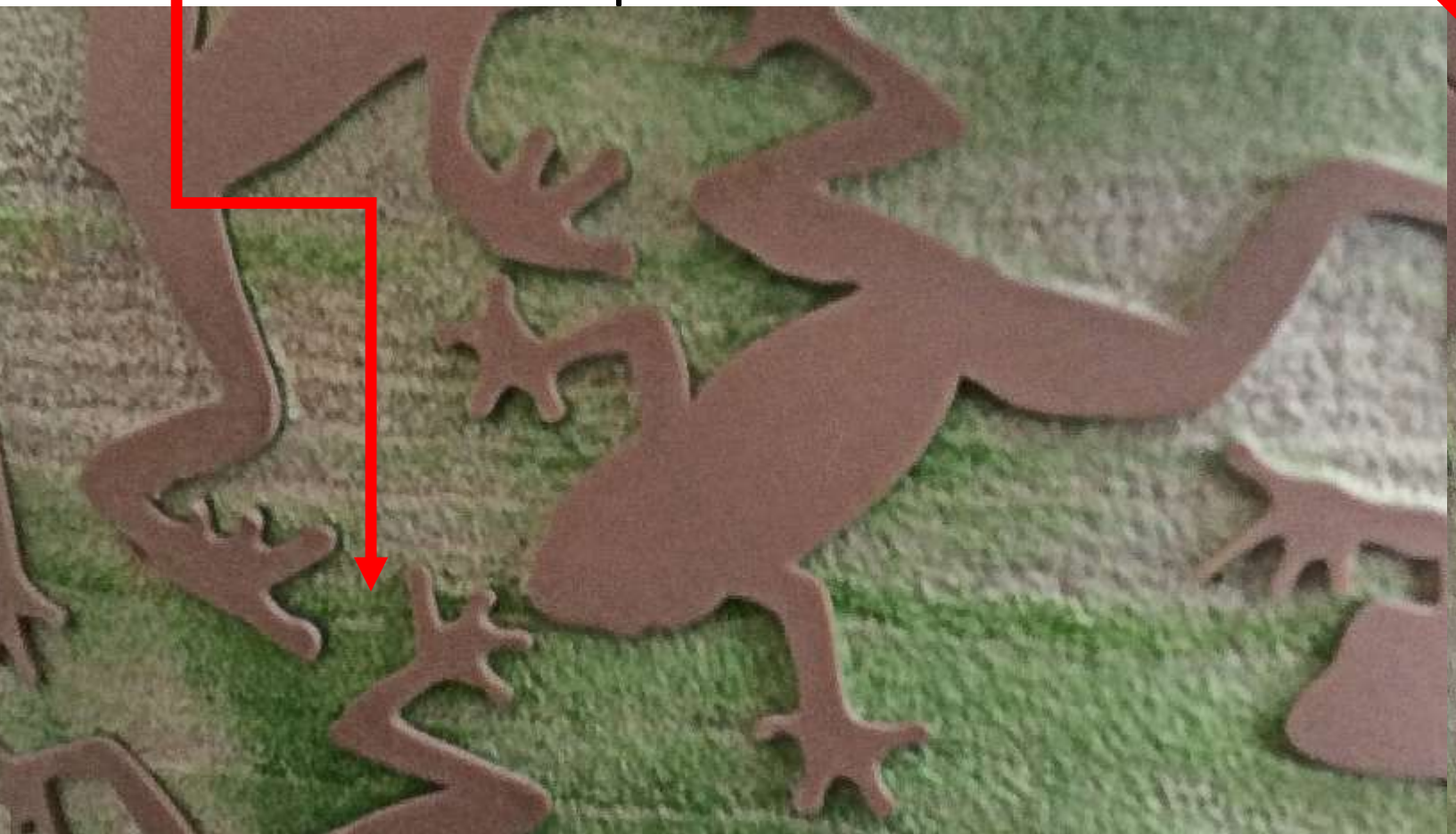
Resist is then cut and applied using transfer tape to maintain the spatial relationship.

Sheets of “weeded" frogs

Frogs applied to the form ready for blasting.

Sandblasting

- Goal is a background that looks even
- Color can be a guide
- End grain may keep more color
- Avoid an oblique blast that can lift the resist



Airbrushed with opaque black.

Using the resist as frisket.

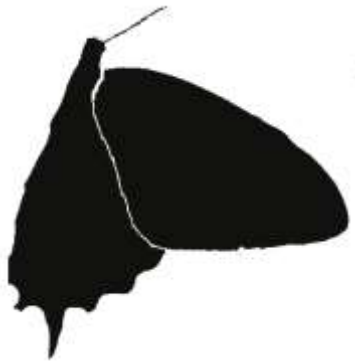
When the resist is removed the green underneath will be revealed..

Resist removed ready for final finishing

Making an image in photo editor

Take a photo

Cut image



Fill with black

Articulate wing

Add missing parts

make mirror image

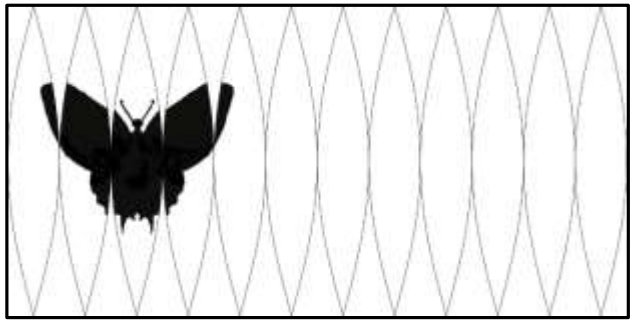
Paste together touch up

Making a gores image

Globe canvas sized for sphere

Width is π x DIAMETER

Height is π x RADIUS



Flexify conversion
equirectangular to gores12

Flexify conversion
with out glue lines

Flexify – free plugin for Photoshop and PaintShop from flamingpear.com

Gores image

Join small pieces
in photo editor

Resist cut from
photo by
vinyl cutter

Gores close on
the sphere
scrap resist covers gap

Blasted image

Sources

- uscutter.com
  - Sandblast resist- Anchor BlastLite™ Stencil #T226, 22 mil
  - Transfer tape- ORATAPE HT55 High Tack
  - Vinyl cutter

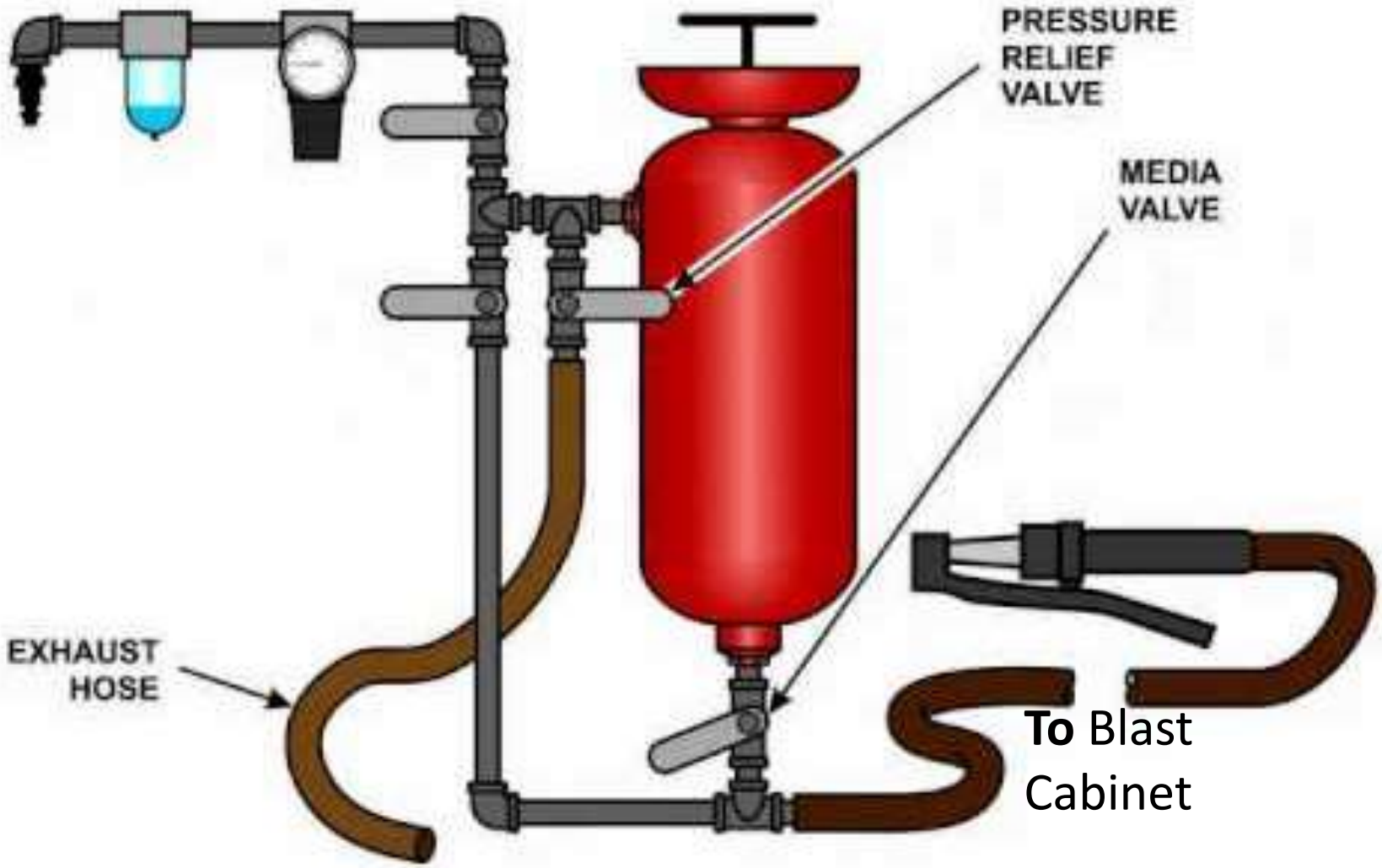
- Grainger.com
  order on line pick up at the store
  - BALLOTINI Blast Media, Ground Glass

- Harbor Freight
  - Blast cabinet

FLOOD – BlastLite not available before September

Hartco- 425 a USCutter recommended substitute

Pressure Pot



Foot Switch added to Pressure Pot