

GLASS Decal Info & Firing SCHEDULES. 2023

We do not print WHITE. We directly transfer decals on to WHITE glass, or we use a layer of white glass at the very back, when stacking up many transparent layers with decals.

Using white glass in this way- allows for richer realization of color because it provides opacity. Clear glass can be a problem with perceiving the actual color. Too much light interference.

Understanding this Technology.

New Pigments! Requires New Firing Schedules using our NEW Blue Flux covercoat!

Our new pigments are now 100% pigment and create much richer and denser decals. As flux free pigments there is an incredible firing range from 1320F to 2300F with no loss of color including brilliant reds and yellows.

New Blue Flux Covercoat for Glass

Our new blue flux covercoat is very compatible with glass. Flux free pigments require the new blue flux covercoat to fuse to top surface of glass at a minimum of 1320F to achieve a glossy aesthetic. With our new pigments there is a range of fusing temps 1320F to 1420F. We recommend that you test your glass and kilns to find the best temps that work for your process.

New Firing Schedules for Blue Flux Covercoat and Glass. (see next page for full firing schedule).

1320F - 1420F

The biggest challenge with glass is at the lower temperatures 1320F-1350F. This requires our blue flux covercoat, without it the decal will be dry and unfused. You will see the edge halo of the flux around image of your decal. There are multiple ways to work this this.

1. Carefully trim to edge of your decal.
2. Cover the entire area of the glass by planning for extra covercoat around the image.
3. Increase your firing temperature to 1350F-1375 to allow the flux in the covercoat to melt more into the glass to create a more subtle flux halo.

1420F-1450F

At full-fuse temperatures of our blue flux covercoat achieves complete fusion and the flux halo is almost imperceptible. If you use non-flux covercoat at 1420F the decal is completely fused with a satin surface. The work will need to be dammed to keep the glass from spreading. If not dammed the imagery will stretch, distort and loss density.

Pink Non-Flux Covercoat for Glass

surface firing.

Our pink non flux covercoat on glass has exciting aspects for using our new flux free pigments to achieve a range of surfaces. By exploring firing temperatures and schedules using the non flux covercoat surfaces can range from matte, to satin to gloss. Using the fusion of the glass to melt the pigments depends on how molton (hot) the glass becomes. The glass itself is fluxing the pigment. We have found that at 1420F decals are a fused satin on the surface.

between layers of glass firing.

When fusing between layers, nonflux covercoat can be used in the first decal firing. Nonflux covercoat at 1320F produces a dry, underfired image. Not a problem, because you are embedding the nonflux covercoat decal between two layers of glass. This is an excellent solution for embedding images between glass. (note: be gentle with the underfired image when stacking between layers of glass, as it is underfired and can be scratched.) We do sift a fine trace of clear frit to reduce bubbles between the layers.

Unsure if you are going to stack your decals between glass? Just order FLUX covercoat- it works both on surface &between glass.

Hot glass techniques that go up to 2300F (for glossy finish).

HERE ARE the FIRING SCHEDULES

New Temperature Range On Glass 1320F-1420F

Must use Blue Flux Cover Coat with this new schedule.

2023. New Glass Decal Firing Schedule

Seg 1	50F per hr.	200F	Hold 2hr.	Vented.
Seg 2	200F per hr.	800F	Hold 15min.	Vented.
Seg 3	275F per hr.	1320-1420F	Hold 10min.	No Venting.
Seg 4	Crash-AFAP	950F	Hold 1hr.	No Venting.
Seg 5	50F per hr.	800F	No Hold.	No Venting.
Seg 6	300F per hr.	600F	Off.	

NOTE: Recent decal customers, using the new blue flux covercoat have had reactions / discolorations when fusing directly to some Bullseye white and gray. We believe bismuth nitrate in the blue flux covercoat is causing a brownish "stain" to occur. One of our decal artists, Kimberly Polka of "the glass station" figured out the following: using a small scrap of the decal carrier sheet, no image necessary, do a decal firing & see if this brownish trace occurs. If so, Kim does this:

Prepare the Bullseye glass by sifting a layer of clear frit powder over the glass & fire to 1325 F. It will act as a barrier btw the decal and the colored glass. THEN follow the directions above for a decal firing. Here is a jpg of that discoloration:



Tack Fuse- saves a firing, rounds the edges of the glass. No damming required.

Glass Decal Tack Fuse 1330F (this is a schedule we share - it saves a firing.)

Seg 1	50F per hr.	200F	Hold 2hr.	Vented
Seg 2	200F per hr.	800F	Hold 15min.	Vented
Seg 3	250F per hr.	1200F	Hold 30min. (Bubble Squeeze)	No Venting
Seg 4	150F per hr.	1330F	Hold 10min.	No Venting
Seg 5	Crash-AFAP	950F	Hold 1hr.	No Venting
Seg 6	50F per hr.	800F	No Hold	No Venting
Seg 7	300F per hr.	600F		Off

We have great success full fusing and decal firing in one firing if the decal is applied to the top layer of glass. At 1450-75F glass moves and damming is required to hold the form. If you don't dam the glass the decal will spread and you will lose detail, density in your imagery. This happens because of the distortion that occurs as the decal and glass stretches.

Bubbles are almost eliminated by sifting a very thin layer of fine clear glass powder between each layer of glass. This is recommended if you do not want bubbles in a full fuse.

Glass Decal Full Fuse 1450F-1475F (For glass that has been previously Decal Fired)

For fusing imagery between layers of glass you are required to fire all decals with the a Glass Decal firing prior to full fusing. At this point your decal fired to glass is all glass and stacking, full fusing and damming has unlimited possibilities. It is highly recommended to sift fine clear glass powder over the pre-fired decal on glass between layers. This almost eliminates bubbles. If you have a bubble form at the surface of the decal it will create a round hole on your image. Glass powder carefully sifted is the hot tip.

Full Fuse after the decal fire:

Seg 1	200F per hr.	800F	No Hold
Seg 2	250F per hr.	1200F	Hold 30min. (Bubble Squeeze)
Seg 3	150F per hr.	1450-75F	Hold 10min.
Seg 4	Crash-AFAP	950F	Hold 1hr.
Seg 5	50F per hr.	800F	No Hold
Seg 6	300F per hr.	600F	Off

Here are links for COE 82 glass that is compatible with commercial float glass.

<http://www.youghioghennyglass.com>

<http://www.armstrongglass.com>

Armstrong Glass sells clear fine glass powder 82 COE that can be used to mitigate bubbles.

You will need a tin scope. Decals are to be applied on the NON-tin side only.

COE 33 Borosilicate Glass

Our decals are boro compatible. Successful transfer and firing are related to how each glass artist uses them.

Our decals are high temp and must be fired to 1350-1380F on boro.

This means that the boro will slump in the kiln so types of forms, thickness and speed of firing need to be tested to get the result the you are looking for.

They can not take direct flame but can be fused with a gentle bushy flame.

It is best to transfer the decal and fire to 1100 F first which is under fired but stable and the boro does not slump.

Then bring up to full temp carefully with the torch.

Best results are to case the decal. Wrap a decal around a tube or rod and fire to 1100F. Then slide that inside a slightly large tube and fuse then together with a torch. This way, the flame does not directly contact the decal. You still need to be careful with excessive heat. You can still fry a decal.

Success with our decals on boro is based on each artist's trials. We have several clients that achieve success with Decals on Boro.

Venting Information

1. Passive Kiln Venting

Most kilns have peep holes or flaps that allow openings in the kiln.

For passive venting peep holes or flap are left open during Segments 1 and 2 that say Vented.

Water and the organic cover-coat holding the image together during transfer must slowly burn out and exit the kiln.

Slightly crack the lid or door of the kiln may also provide additional venting.

It is fine to have peep holes or flap open and the lid and door slightly cracked for Segments 1 and 2 up to 800F.

After venting is complete plug the peeps, close the flaps, shut the door or lid at the beginning of Segment 3.

This requires that you are there to close the vents

The Kiln Room must be well vented to remove fumes exiting the kiln.

2. Internal Down Draft Kiln Vent

There are several companies that make down-draft kiln venting kits to install on your kiln. Small holes are drilled in the lid and floor of the kiln and a metal cup is mounted outside the kiln under the floor below the floor holes. Heat treated rubber hose is attached to the metal cup and a small fan blows kiln exhaust out through the wall.

With new kiln you can program the vents to come on during Segments 1 and 2 when venting is required.

For older kiln you can turn the venting on at the beginning of the firing and just leave it on for the entire firing.

We recommend this type of venting. The interior of the kiln always has a flow of fresh air, you don't have to be there to close passive vents as all fumes are exhausted directly outside and do not enter your kiln room.

Good venting is required for health and safety and produces the best color results with our decals.