



Box Basics

This project sheet provides the reader with all the basics – fill weights, schedules, and techniques – for using Colour de Verre’s box base and lid casting molds. The resulting pieces can “stand alone” or can be embellished with other Colour de Verre designs.



Each design consists of two molds. One mold – the larger of the two – is used to cast the box base. The other mold; the lid.

For a successful casting, there are three important steps to remember:

- Prime the mold correctly.
- Heat the molds no faster than 300°F (165°C) per hour.

- Don’t rush the annealing schedule. The controlled cooling of the kiln prevents internal stresses from cracking the piece.

Getting Started

The two molds must be primed so the glass doesn’t adhere.

Always start the same way: Clean your Colour de Verre box lid and base with a stiff, nylon brush or a green 3M Scotch-Brite™ pad to remove any old kiln wash. (This step can be skipped if the mold is brand new.)



There are two choices for primers: Hotline Primo™ Primer and ZYP BN Lubriccoat™ (formerly MR-97). The ZYP is the easiest to apply and remove. It is an aerosol and, after firing, brushes off easily from the molds and can be washed off the glass pieces. Castings created using ZYP have exceptionally

smooth surfaces and almost never require grinding or “cold work.”

When applying or removing either of these two primers, it is advisable to wear a dust mask.



Primo is a traditional kiln wash that is applied with an artist’s brush. It’s a trusted and proven product, but requires a bit more “elbow grease” to remove after firing. Primo’s big advantages are its low cost and availability.

Brief instructions for each option follow:

To apply ZYP, work in a well ventilated area or outside, and hold the well-shaken can 10 to 12 inches from the base mold. Hold both the mold and the spray can upright. Apply the first coat using a three to four-second burst of spray in a sweeping pattern across all the mold’s cavities. Do not saturate the surface. If it is the first time ZYP

Availability

Colour de Verre molds are available at fine glass retailers and many online merchants including our online store, www.colourdeverre.com.

Tools

- ✓ A Colour de Verre Box Lid and Base mold set
- ✓ Large primer brush
- ✓ Digital scale
- ✓ Two small, plastic containers
- ✓ Diamond pad or grinder

Supplies

- ✓ Hotline Primo Primer™ or ZYP BN Lubriccoat (formerly MR-97)
- ✓ Assorted frits, sheet glass, billets, casting rocks, etc.

has been applied to the mold, it is necessary to apply a second coat of the product.

Before applying the second coat, let the mold dry for five minutes. Apply the second coat using another four to five-second burst of spray. Repeat this process with the lid mold using a two to three-second burst of spray. Let the molds dry for ten to fifteen minutes before filling. Again, the double coat of ZYP only need be applied the first time the molds are used. Thereafter, only one coat is necessary. For more information about ZYP, visit Colour de Verre website's Learn section. There, download and read "Advanced Priming with Boron Nitride Aerosol" and watch the video "Priming with ZYP BN Lubricat."



If you choose to use Primo Primer, mix one part dry primer powder with four parts water. Next, give the molds *five* coats of Hotline Primo Primer™.

Apply the Primo Primer™ with a soft artist's brush - not a hake brush - and use a hair dryer to completely dry each coat before applying the next. The mold

should be totally dry before filling. The primer need not be pre-fired.

One important hint: This primer settles very quickly. Each time the brush is dipped, be sure to give the primer a good stir so all the ingredients stay in solution. If the primer has sat more than 5 minutes, the active ingredients will cake on the container's bottom. Make sure to stir these sediments back into solution.

Filling the Molds

The molds are intended to be used with COE 96 or COE 90 art glass. Colour de Verre molds should not be used with borosilicate, Pyrex, crushed bottles, or float glass. At the temperatures necessary to melt the later glass formulations, the kiln wash starts losing its effectiveness.

The designs can be filled with any frit mesh, billets, casting rocks, glass pebbles, sheet glass – broken

or cut-to-fit, "nipped" rods, or a combination of these forms. For larger glass formats like billets and

Fill Weights*

Design	Base	Lid
3½" Round	295	115
4x5" Rectangle	450	220
6" Elliptical	375	180
5" Kidney	385	180
3½" Heart	310	130

casting rocks, we suggest that the "hold" at the maximum temperature be increased to give the glass a chance to conform to the mold rather than increasing the target temperature.

The table above lists how much glass (in grams) should be arranged in each design's base and lid. We often refer to these weights as "fill weights."

Place a container on the digital scale. Zero the scale and measure out the frit for the base. If your

Casting Schedule*

Segment	Ramp	Temperature	Hold
1	300°F/165°C	1250°F/675°C	30 minutes
2	300°F/165°C	1410-1420°F/765-770°C	30-60 minutes
3	AFAP	960°F/515°C	90 minutes
4	50°F/30°C	800°F/425°C	None
5	100°F/60°C	600°F/315°C	Off. No venting

Fire Polish Schedule*

Segment	Ramp	Temperature	Hold
1	200°F/110°C	1300-1325°F/705-715°C	10-20 minutes
2	AFAP	960°F/515°C	90 minutes
3	50°F/30°C	800°F/425°C	None
4	100°F/60°C	600°F/315°C	Off. No venting

*Schedule for COE 96. For COE 90, increase casting temperature by 25°F/15°C. AFAP means "As Fast As Possible", no venting.



scale doesn't have a zero or tare function, simply account for the container's weight in your measurements. With a second container, repeat the process weighing out enough frit for the design's lid. Carefully pour the weighed glass into the primed molds. When casting, glass spurs can be formed as the hot glass melts and compacts and then drags down the mold's interior. To reduce or eliminate spurs, mound the glass towards the design's center. Fine frit produces fewer spurs than larger frit or cut sheet glass. Spurs can be ground and the pieces fire polished. If ZYP is used rather than Primo Primer, casting spurs are eliminated or greatly reduced.

For projects where different types of glass is combined, it is often easier to weigh the glass in the mold.

Place an empty mold on the scale, zero the scale, and fill the mold directly stopping when the fill weight is reached.

When arranging larger glass frit or cut glass pieces in the molds, load and arrange the glass gently as the sharp edges can scrape

away the kiln wash or ZYP from the mold. This could contaminate the glass or cause the casting to stick.

Firing the Molds

Place the two filled molds into the kiln. Use the Casting Schedule below as a guide. Don't rush the schedule's slow cooling ramp as this allows for proper annealing. Also note that the schedules need to be modified for kiln load, COE, and glass color. Heating element position can also effect firings. Use lower temperatures when using a lid element kiln.

Another factor is whether the glass is opal or transparent. It is always a good idea to "cut" your opal glass by mixing it with 50% or more clear or transparent glass.

For opal glass, reduce firing temperature by 25°F (15°C) and use shorter hold times. Opal glass has

a tendency to absorb more heat. These high, prolonged temperatures can make the kiln wash difficult to remove from the mold and glass. If this occurs, fine sandpaper or a dry, non-scratch, nylon, kitchen scouring pad, e.g. Scotch-Brite™, can be used to remove stubborn kiln wash.



Fire Polishing

With any casting process, there is a chance for glass spurs to develop. If the casting has any spurs, remove with a power grinder or a diamond pad. Clean and re-prime

High Gloss Firing Schedule*

Segment	Ramp	Temperature	Hold
1	200°F/110°C	1150°F/620°C	5 minutes
2	AFAP	1275-1300°F/690-705°C	None
3	AFAP	960°F/515°C	90 minutes
4	50°F/30°C	800°F/425°C	None
5	100°F/60°C	600°F/315°C	Off. No venting

*Schedule for COE 96. For COE 90, increase casting temperature by 25°F/15°C. AFAP means "As Fast As Possible", no venting.

Tacking Schedule*

Segment	Ramp	Temperature	Hold
1	200°F/110°C	1250-1275°F/675-690°C	5-10 minutes
2	AFAP	960°F/515°C	90 minutes
3	50°F/30°C	800°F/425°C	None
4	100°F/60°C	600°F/315°C	Off. No venting

*Schedule for COE 96. For COE 90, increase casting temperature by 25°F/15°C. AFAP means "As Fast As Possible", no venting.

the molds, and place the smoothed pieces into the freshly primed molds. Re-fire the piece according to the Fire Polish Schedule. The lid should always be placed back in its freshly-primed mold whenever it is being fire polished or when tack fusing embellishments to it.

glass, use temperatures in the higher range of Segment 2.



High Gloss Firing

Most people like the subtle contrast between the lid's high gloss surface and the satin surface of the base. However, people occasionally wish to have the base's surface perfectly match the lid's gloss. If you wish to "gloss" the box's base, place the cast, glass base into the kiln without its mold, right side up, on a kiln shelf protected by Thin-Fire, Papyros, or kiln wash. Follow the High Gloss Firing Schedule.

This firing is designed to melt the piece's outer surface without softening the piece's core and causing it to loose shape. Remember that darker and opalescent colors absorb more energy and will heat faster and hotter. For darker and opalescent glass, use temperatures in the lower range of Segment 2. For transparent, light, and iridized



Fusing Components To Lids

Boxes can be embellished by tack fusing elements to the lids. Possibilities include Colour de Verre castings; frit balls; slumped rods; and shaped noodles, streamers, and stringers.

Place the lid in a freshly-primed mold. (This prevents the lid from warping.) Arrange the glass elements on the lid. A drop or two of white glue can be used to temporarily hold the piece in place. If the elements have been slumped or shaped, support the pieces with wedges of fiber paper. Fire according to the Tacking Schedule.

Base Feet

Give cast boxes a professional finish with the addition of feet. Use peel-and-stick, silicon cabinet bumpers, e.g. 3M Bumpon™, available from most hardware stores. This will also protect tabletops.