Color Mixing

Just like paints, glass frit can be mixed to create subtle shades. Use our method to create glass "paint chips." From these chips you can choose the perfect frit blend for a particular project.

Test tiles are made sixteen at a time using Colour de Verre's Color Blender mold. First, reference tiles are made using frit directly from the container. Then the same frit is used to tint Water Clear or White Opal frit. The Water Clear mixtures result in a series of translucent tiles each of a different color intensity. The White Opal frit mixtures result in different saturations – pastel versions – of the original color.

While this project sheet explores color saturation and intensity, the same method can be used to test mixtures of multiple frit colors. For example, many people feel that a one-to-one mixture of fine Uroboros Ming Green and fine Citron produces the perfect leaf green. Using our method, the artist can create a range of greens and choose the shades that best suits his or her particular project.

Frit color and opacity aren't the only factors affecting results. Casting with different frit grades (powder, fine, medium, and coarse) also affects outcomes. When a powdered frit melts and then re-solidifies, it catches small air bubbles. The result is a less saturated, less transparent piece of glass. On the other hand, larger frits trap less air bubbles than powdered frits, but don't mix as smoothly. Neither result is better than the other. However, one result might be better suited to a specific project. A common technique or compromise is to use *powder* frit to tint a clear or opal *fine* frit. This is what we will do in our example.

Preparing the Molds

The molds must be primed so the glass doesn't adhere to the ceramic material from which the molds are made. There are two choices for primers: Hotline Primo™ Primer and ZYP BN Lubricoat (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 pieces. Castings created using ZYP have exceptionally smooth surfaces and almost never require grinding or "cold work."

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

Availability

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

Tools

- ✓ Color Blender mold
- ✓ Small primer brush
- ✓ Small containers for mixing frit
- ✓ Digital scale

Supplies

- ✓ Hotline Primo Primer, or ZYP BN Lubricoat
- ✓ Colored powder frit
- ✓ Fine Water Clear and White Opal frit

firing. Primo's big advantages are it's low cost and availability.

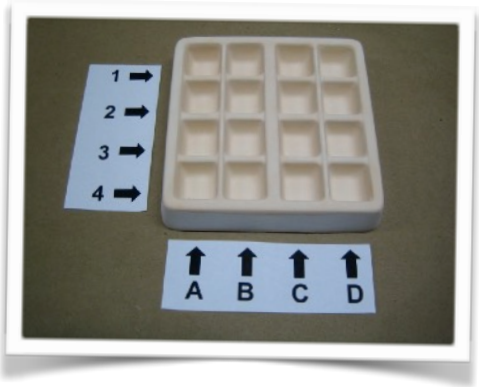
Brief instructions for each option follow:

To apply ZYP, hold the well-shaken can 10 to 12 inches from the mold. Hold both the mold and the spray can upright. Apply the first, light coat using a two to three-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 has been applied to this 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 two to three-second burst of spray. In either case, let the mold dry for ten to fifteen minutes before filling. Again, the double coat of ZYP need be only applied the first time. Thereafter, only one coat is necessary. For more information about ZYP, visit Colour de Verre website's Learn section. Then, download and read *Advanced Priming with Boron Nitride Aerosol*.

If you choose to use Primo Primer, give your mold three to four thin, even coats of Hotline Primo Primer kiln wash. Use a soft artist brush to apply the Primo Primer and a hair dryer to completely dry each coat before applying the next. Again, more detailed instructions can be found in the Learn section of Colour de Verre's website. See *Tricks of the Trade.* When using Primo Primer, best results are obtained when using fine frit. Larger frit can produce excessive casting spurs that require cold work.

Preparing the Molds

Let's refer to the mold's rows – top to bottom – as rows 1, 2, 3 and 4. Let's refer to the mold's columns – left to right – as columns A, B, C, and D. That way, we can easily talk about rows, columns, and specific tiles.



Choose three colors of powder frit. Use a small spoon to fill tile A, in row 1 with first frit color. Next, fill tile B, row 1 with the second color. Tile C, row 1; the third color. These will be our reference tiles – how the frit looks coming straight out of the bottle.

Row 2 will be filled with mixtures made with the first colored frit. Row 3; with the third. And row 4; the fourth.

Each of the Color Blender's depressions hold about five grams. To make the math and the measuring easy, we will mix 10 grams for each test tile. The extra can be placed in a small, plastic bag and labeled for future use.

In row 2 and 3, we will make 50%, 20%, 10% and 5% mixtures of colored powdered frit and Water Clear fine frit.

Measure out the frits according to the following table and mix each frit combination well by shaking in a small, capped container. Fill the appropriate tile cavity with the mixture and bag and label the remainder for future projects.

Tile	Mix	Colored Frit	Water Clear
A	50%	5 grams	5 grams
B	20%	2 grams	8 grams
C	10%	1 gram	9 grams
D	5%	0.5 gram	9.5 grams

Row 4 will be an experiment with color saturation. Mix the third colored powder frit with fine

White Opal frit according to the following table.

Tile	Mix	Colored Frit Number 3	White Opal
A	50%	5 grams	5 grams
B	20%	2 grams	8 grams
C	10%	1 gram	9 grams
D	5%	0.5 gram	9.5 grams

Put these mixtures into the fourth row.

Use the following firing schedules – one for 96 COE and one for 90 COE – to fuse your test tiles. Remember that each kiln has its own "personality." You may have to adjust these schedules for your kiln.

Some people find it handy to glue these reference tiles directly to the frit bottle.

COE 96 Casting Schedule

Segment	Ramp	Temperature	Hold
1	300°F/165°C	1420°F (770°C)	10 minutes for powder and fine frit 10-20 minutes for medium frit
2	AFAP	960°F (515°C)	30 minutes, Off

COE 90 Casting Schedule

Segment	Ramp	Temperature	Hold
1	300°F/165°C	1440°F (780°C)	10 minutes for powder and fine frit 10-20 minutes for medium frit
2	AFAP	960°F (515°C)	30 minutes, Off