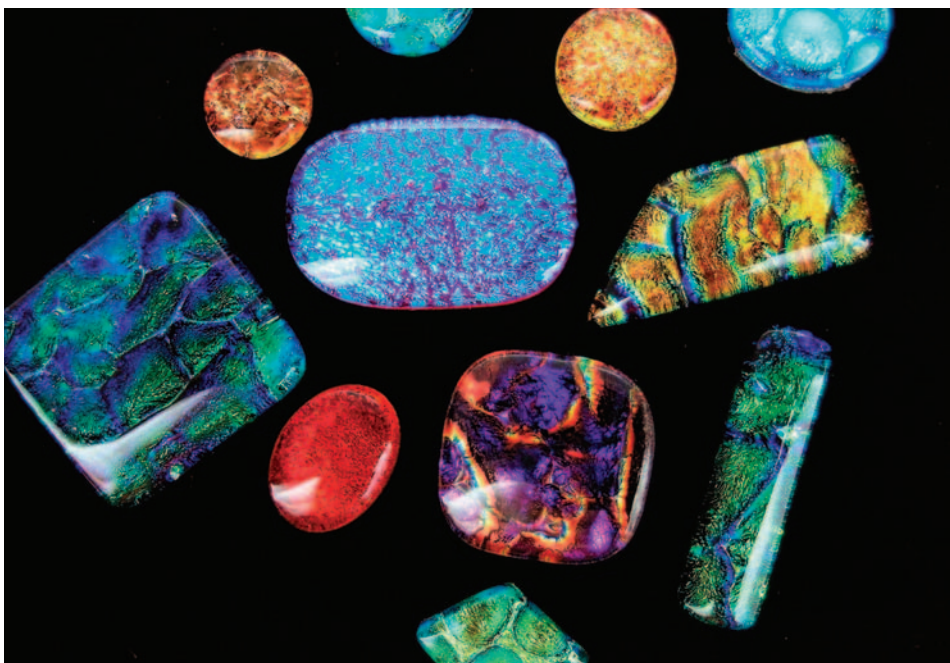


# Making Dichroic Glass Cabochons

by Pam Lacey



Dichroic glass cabochons by Pam Lacey.

**G**lass is perfect for adding color to PMC designs. This versatile material is available in a range of colors, patterns, and forms. It can be manipulated with the heat of a kiln or torch, or cold-worked with abrasives and tools. The variety of ways glass can be used makes it an excellent adjunct material to use with PMC.

One of the easiest ways to get started using glass in your designs is with glass cabochons. While glass cabochons are widely available, it is also fairly simple to make them yourself. Making your own gives you more control over the quality of the cabochons you're working with, and thus over your finished piece. Even if you opt to buy your glass cabochons, being familiar with the common pitfalls of making them will help you know what to look for when buying them.

One of my favorite glasses to work with is dichroic glass, primarily because the material's metallic brilliance is a great match for fine silver. This article will lead you step-by-step through the process of making a simple black-backed, clear-capped dichroic glass cabochon. Once you're familiar with the process, you may want to experiment, layering and fusing

different colors of glass together to create one-of-a-kind cabochons.

## Materials:

- Kiln wash or ThinFire® shelf paper.
- Manual or programmable kiln capable of reaching and holding 1500°F (815°C).
- High-temperature kiln gloves and protective eyewear.
- Black-backed, thin dichroic glass. This should be slightly smaller than the desired cab size to accommodate the glass spreading at high temperatures.
- Thin clear glass. This should be  $\frac{1}{8}$ " to  $\frac{1}{4}$ " longer in length and width than the dichroic glass piece.

**Note on choosing glass:** For dichroic glass, I prefer Coatings by Sandberg (see resources below) on a Bullseye substrate. This means the dichroic coating is on Bullseye glass.

All glass has a coefficient of expansion (COE), the rate at which glass expands and contracts. This rate is a significant factor in determining the compatibility of different types of glass. A piece made with glasses with different COEs are likely to crack during the cooling process. Because the other

glass in my studio is also Bullseye, I use dichroic glass on the same substrate to avoid mixing glasses inadvertently. There are many other manufacturers of fusible glass whose products could be used instead. The key is to make sure the different glasses you're using all have the same COE.

Another important factor to consider in choosing glass is whether it will react with the PMC. Some clear and colored glass will interact with silver and produce a yellow or grayish tint. Bullseye Glass Co. makes a clear glass specifically developed to alleviate this situation called Bullseye Crystal Clear #1401 (see resources below). When buying glass cabochons, ask the supplier what kind of clear glass was used. If the supplier doesn't know what type was used, it's best not to fire the cabochon in place, to avoid possible yellowing of the glass where it comes in contact with the PMC.

**Note on cutting glass:** Entire articles have been devoted to the art of cutting glass. Cutting glass takes a quality cutting tool and lots of practice. Thickness, texture, opacity, and even ambient temperature can affect how glass will cut. Most beginning stained glass or fusing technique books will provide an introduction to cutting glass, including recommended tools. To save money while you learn, ask at your local glass supplier for scrap window glass — some will give it away for free or at a greatly reduced price. Having a ready supply of cheap glass means it won't matter how many mistakes you make while you perfect your cutting ability. When you are ready to cut the more expensive art glass, many suppliers sell glass in quarter or eighth sheets (versus full or half sheets), which are easier to work with initially.

**Step 1. Prepare the kiln shelf.** This is an important step, since without proper preparation, the glass will stick to your kiln shelf. I work with glass frequently, so I find kiln wash more economical. Though it costs a little more, many people prefer the convenience of shelf paper. Whichever you choose, follow the manufacturer's instructions for shelf preparation.

**Step 2. Stack the glass.** On the prepared shelf, layer the piece of clear glass on top of the dichroic glass, with the dichroic glass facing up. Position the clear glass so there is an even amount of clear overhang around all edges of the dichroic piece.

The reason for this overhang is to prevent the dichroic coating from "lipping up" onto the edges of the clear cap during firing. The amount of overhang depends on the texture of the dichroic glass: Deeper textures require more overhang, since some of the clear glass will be consumed by filling in the texture during firing.

**Step 3. Fire the glass.** In a manual kiln, turn the kiln to low and give the glass and shelf about 15 minutes to warm up. For cabochons that are less than 2" on all sides, you can set the kiln to medium and then to high after this initial warming, ramping up to 1500°F over an hour. (Larger pieces require a different firing schedule, but most cabochons will be less than 2" on all sides.) When the kiln reaches 1500°F (815°C), "soak" the glass for 10 minutes by holding the temperature constant. In a programmable kiln, ramp up the temperature at a speed of 1500°F (815°C) per hour, and soak at that temperature for 10 minutes.

*Note: The brittle zone for glass is between 700°F (370°C) and 1000°F (540°C). Opening the kiln in this temperature range can cause thermal shock that will damage the glass.*

After the soak, carefully and quickly peek in the kiln to check the glass. (Be sure to wear high temperature gloves and protective eyewear for this step!) It should only be a quick look, since allowing the temperature inside the kiln to drop below 1400°F (760°C) may result in devitrification, a scummy or cloudy surface on the glass.

Your cabochon is fully fused when the glass is glowing red, and is smooth on all sides. If the edges of the glass are not smooth, close the kiln door and let the temperature reach 1500°F again. Soak the glass for another five minutes. Continue the process of soaking and checking the glass until your cabochon is smooth and fully fused.

Glass naturally wants to round and flatten at high temperatures. If you're trying

to keep a certain shape, you'll need to watch your glass carefully to avoid this. On the other hand, if you want rounded edges, you can use this property to your advantage by allowing the glass to soak long enough that the edges round on their own, eliminating the need for cold-working or finishing.

**Step 4. "Crash cool" the glass.** Once the glass is fully fused, turn off the kiln and open the kiln door until the temperature drops to 1000°F (540°C). This is called crash cooling, and it's done to prevent the glass from sitting between 1200°F (650°C) and 1400°F (760°C), the temperature range where devitrification can occur. Close the kiln door. Repeat this process until the kiln stabilizes at 1000°F (540°C).

**Step 5. Anneal the glass.** With the kiln door closed, allow the kiln to gradually drop to the annealing temperature of the glass you're using. The manufacturer of the glass can tell you what the annealing temperature is. (The Bullseye glass I used for this project has an annealing temperature of 978°F/525°C.)

Annealing helps to reduce the stress in the glass that occurs during the cooling process, and is done to prevent shattering and cracking. Such damage can happen immediately, weeks, months, or even years after a piece is made.

When the annealing temperature is reached, turn the kiln back on and hold the annealing temperature for 20 to 30 minutes. (For programmable kilns, you may want to program another segment for the annealing and cooling cycles.)

When firing cabochons in place in PMC, it's important to take the piece through the same firing and annealing cycles described here. When buying glass cabochons, ask the supplier what kind of glass was used and whether or not the cabs were annealed. Knowing the kind of glass will help you determine the annealing temperature. If the cabs weren't annealed, and you're not planning to fire them in place, you'll need to anneal the cabochons yourself in a separate operation. (I don't recommend buying cabochons that aren't

annealed. It is a critical step, and a quality-focused artist will properly anneal the glass to prevent later damage.)

**Step 6. Cool the glass.** With the kiln on, cool your glass slowly until it is out of the brittle zone, reaching a temperature of 700°F (370°C) or less. I usually allow about two hours for this cooling time. Once the kiln temperature has reached 700°F (370°C), you can turn off the kiln and allow it to come to room temperature.

The entire cooling phase can take several hours, and it's important not to peek in the kiln below 1000°F (538°C). You may want to schedule your firing so the cooling process happens overnight.

**Congratulations!** You now have a quality glass cabochon to use with your PMC designs. With all the colors, patterns and textures of glass available today, the possibilities for creating beautifully unique glass cabochons are endless. Enjoy!

*Pam Lacey, owner of Inspired Pieces, is a jewelry and glass artist who lives in Connecticut. Also self-employed as a writer specializing in new products, Pam feels blessed to be able to live the creative life every day.*

## Resources for this project:

**Dichroic glass:** Coatings by Sandberg, Orange, CA, 714-538-0888, [www.cbs-dichroic.com](http://www.cbs-dichroic.com). Retains color and brilliance at high temperatures. Sample packs (2" square pieces) as well as scrap packs are available.

**Clear glass:** Bullseye Crystal Clear #1401, The Bullseye Connection, Portland, OR, 888-220-3002, [www.bullseyeglass.com](http://www.bullseyeglass.com). You can also purchase other fusible glasses, ThinFire shelf paper, kiln wash, high-temperature gloves, and other fusing tools here if needed.

**Protective eyewear:** AUR-99, Shade 2.0, Aura Lens Products, Inc., Sauk Rapids, MN, 800-281-2872.