

Getting Acquainted with Satake Glass

BY JO HOFFACKER

Most of the information I've gained about using Satake glass has come from trial and error, with the occasional question to my friends Ayako Hattori and Jeff Barber, who both make stunning Satake beads. So here is a basic Q&A primer on Satake.

How many colors does Satake have?

There are a total of 160 colors in the Satake line, counting both soda and lead. These colors include primary colors, pastel colors, and colors based on tones from traditional Japanese kimonos, as well as several others that are really cool and different. While many similar colors exist in both lines, an experienced eye can usually tell the difference—but not always! However, in some colors such as white, black, and clear, lead and soda can really only be told apart if the rods are labeled.

What is the difference between Satake's lead and soda limes?

They are both soda-lime glass, but there is a difference between the two in composition and more importantly in Coefficient of Expansion (COE). Lead has a COE of 120, while soda is 113. Simply put, part of Satake's line is leaded and the other part is not. It's just easier to use the word "leaded" to differentiate the two.

How do I tell Satake lead and soda apart?

The easiest way is to make sure your rods are marked. The numbers will tell you which they are. To the untrained eye, the two Satake color lines can be very difficult to tell apart. For this reason, most beginners only keep one kind on hand. Even those with experience will make sure each rod is well marked! It can be heartbreaking if you happen to make your masterpiece only to find out it shatters in the kiln—or even while on the mandrel—because you mixed larger amounts of the two. You have to be careful which rods you grab! Here is an easy Satake number reference list for you, along with a breakdown of which are leaded and which are soda:

Lead	Soda
94 colors	66 colors
120 colors	113 COE
A-01 to A-26	A-27 to A-40
no lead in E	E in all of them
G-01 to G-35	G-36 to G-40
S-01 to S-33	S-34 to S-40

How do I anneal my Satake beads?

This is the annealing schedule recommended by Satake glass:
Anneal at 890°F for 10 to 20 minutes.
Lower to 750°F, 20 minutes for small beads, 1 hour for large beads.
Lower to 390°F for 2 hours.
Turn off and cool to room temperature.

My personal variation is to garage my beads at 850°F, then raise the temperature to 885°F for a minimum of one hour, then cool at a rate 100°F per hour. Be careful to not open the kiln to peek before it cools! You only need one kiln full of cracked beads to learn your lesson.

Is Satake really like water on a stick?

Well, if you are used to working with boro it sure is! Satake is a very soft glass and prone to thermal shock. Because it holds heat much longer than other brands of soda glass, it is well suited to cooling in vermiculite or under a fiber blanket and then batch-annealing at the above temperatures. I recommend using a mandrel rest in the kiln to elevate the beads off the floor in case they are put in the kiln a bit too hot. Because of its thermal characteristics, Satake glass stays soft much longer than other brands of glass, so be sure it really is hard before you put it in the kiln, fiber blanket, or vermiculite or you will end up with some unintended surface decoration!

My Satake rods pop all over the place. What do I do?

Satake glass is *very* prone to thermal shock. If you don't have a rod warmer or curling iron heater, your best bet is to introduce rods to the flame very slowly and give it plenty of time to heat up. I do recommend using a rod warmer (available from Aura Lens) to preheat the rods you are planning on using. You can also use a curling iron heater from a beauty supply store. Another option is to put the rod halfway into your kiln or even put it on top of your kiln to preheat. Preheating your rods

will cut down on the amount of glass popping onto your workbench but probably won't eliminate it. It's worth repeating that you should introduce the rod to the flame very slowly and give it plenty of time to heat up.

Why are some of my rods really fat and some really thin?

All Satake rods are handpulled, so there is no machine extrusion to create uniformity, only the skills of the person doing the pull. Essentially, a batch of glass is melted in a furnace to about 1300°C (2400°F), and the puller gathers a blob on the end of a long iron pole, adding successive layers until they judge that they have the right amount of glass for one pulling run. They start a stringer from the blob. Then using a jig made of fire brick that is on the floor, they pull the "stringer," which will be the finished rod, around the length of the jig. Since the glass is cooling the instant it comes out of the furnace, you can see how it would take some practice to maintain a uniform diameter from one end of the pull to the other! When it has cooled, the very long rod is cut into approximately uniform lengths, depending on the eyes of the one doing the cutting.

What kind of torch should I use?

Hotter is not better with Satake. Hotter will just lead to boiling the glass. I have used a Minor, Betta, and Hot Head with Satake. Japanese lampworkers use a vertical torch that looks sort of like a big Bunsen burner, often with a ring around the outside of the cone that they can use as a fixed marver or to preheat murrine.

I only have a Hot Head torch. Will I be okay?

In a lot of ways, using a Hot Head on Satake is easier than using an oxy/propane setup. Since the melting point is lower than Moretti, Bullseye, and other glasses of this type, the hotter flame on the oxy/propane setup can be too much for the Satake if you aren't careful. In fact, the standard Japanese setup uses a little air compressor with propane, and they get amazing results. The lower heat of the Hot Head can give you a greater cushion against boiling and fading of colors—reds and pinks are especially prone to fading—since you can't put as much heat on your gather, even if you wanted to! Working with Satake definitely teaches patience.

Why am I getting bubbles in my bead?

There could be several reasons for this. If you are getting bubbles when you make the first wrap of glass around the mandrel, it means you don't have the mandrel hot enough before putting on your first lay of glass. If you have lots of little tiny bubbles on the surface of your bead, it means you are boiling your glass. Work the glass further out of the flame and you should be fine. If your bead has bubbles distributed throughout, don't feel bad. That happens to even the best! Lots of practice will keep this result to a minimum. And finally, Satake is handpulled glass; it can have small amounts of air bubbles inside the rod that get transferred to your bead. Bubbles like this can be reduced in transparent beads if, instead of wrapping successive layers of glass directly from the rod, you first form a gather of the transparent you wish to lay and make it into a paddle. Then wrap that paddle in one layer around the base bead.

Is there anything special I should know about the colors?

Yep. Don't encase yellow! A yellow base bead that is encased will nearly always crack. Also, the white colors as well as light browns tend to spread out and swallow other colors if you heat them too much. This can be used to your advantage, but be careful if you want precise dots. Encasing your stringers in clear will reduce the spreading. Work pink opaques especially cool, as they lose their color very easily if overheated.

Are there any other helpful hints to make my first experiences with Satake better?

Be gentle. This glass is much softer than Moretti when glowing, and it retains its heat much longer. You will need to be very gentle when shaping things such as bicones and barrels. Also, be sure to use clean marvers and rust-free mashers to ensure you don't transfer anything to this soft glass. And finally, it bears repeating that Satake glass needs to be worked cool!! Have fun, experiment, and enjoy.