



# Northstar Glassworks, Inc.

## BoroNews Newsletter

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April 2002

Issue 8

## The Ruby Family

### Introduction

Hello! Welcome back to the BoroNews Newsletter!! We are back on track with part five of nine in our color exploration series. For those of you just joining us, this nine part series has been created to help give the lampworker more knowledge regarding the vast potential of Northstar® Borocolour® and inspire the broadening of artistic horizons. This issue will cover the ruby family which includes: NS-05 Orange, NS-06 Dark Orange, NS-07L Light Ruby, NS-07 Ruby, and NS-08 Dark Ruby. With ruby glasses, there are many beautiful effects that can be produced. We will explore how to use ruby glass and what exciting new variations can be produced in combination with other colors.

### The Science Behind the Color

When striking ruby glass, you are actually “growing” crystals in the body of the glass. By soaking the glass at the strike temperature, electrons are allowed to freely move and form crystals. The color is dictated by the size of the crystals. When striking, the crystals will continue to grow, clouding the glass. The result of overgrowing the color crystals is a livery color. This can occur if the ruby is struck too hot and for too long. To yield a vibrant ruby, crystal growth must be controlled with the temperature and strike time. By heating a ruby until it is completely clear, you have dissipated all the crystals (the striking (crystal growth)) and then the striking process can then be repeated.

### Working The Rubies

When working with ruby glass, do so in a neutral to slightly oxidizing flame. For rubies, the easiest way to uniformly strike them is in an electric oven.

Recommended striking temperature is 1050 F or 560 C. A higher annealing temperature will strike the color more quickly than a slightly lower annealing temperature, and a cooler, slower, longer strike is better for the color. Rubies can be struck in the flame by slowly reheating the piece with an oxidizing flame if needed.

### Striking Properties

Each of the rubies in this family is designed for a different purpose and has a slightly different strike rate. The key to achieving a brilliant ruby is to work it as hot as possible (without boiling) so that the ruby returns to the un-struck state (clear), and then re-strike it in an oven. While striking, keep an eye on the piece so it does not darken more than desired (if you have a digital controller, you can set it to hold for a specific time period). To get an idea of how long a particular ruby takes to strike, take a piece of ruby and heat it in the flame until it is clear. Then, place the glass in your preheated oven, and time how long it takes to strike. With this data you can program your digital controller and not have to worry about overstriking.

The general rule is that the darker and more saturated colors will strike more quickly. NS-07L Light Ruby is designed for kiln striking and can be worked for long periods of time and as a result may be difficult to flame strike. While NS-07 Ruby can be flame or kiln struck, it can become livery if struck too hot and/or for too long. NS-08 is the ideal red for stringers because it holds its intensity when thinned. NS-08 can be flame or kiln struck, but because of its intensity, over striking can be an issue (to minimize over striking, check the glass periodically during the striking process).

Because some colors strike at different rates one must keep a watchful eye while colors are striking simultaneously. If you have many different colors in

the same kiln or in the same piece, one color could become darker than you want while waiting for the other to strike. Example: NS-07 Ruby becomes darker than you want while you are waiting for NS-05 Orange to strike.

### Flame Striking vs. Kiln Striking

As noted before, the easiest method to strike ruby glass is in a kiln. This is because with a kiln, the temperature can be regulated, and as a result, an even strike can be achieved. When flame striking a ruby, use an oxidizing flame and heat the piece until it just starts to glow. If the glass is over heated and/or heated to quickly, the color crystals will grow too large and the ruby will become livery. By gently heating the piece repeatedly an even strike can be achieved. The cooler the flame and the slower the strike, the more control you have over the color and you minimize the chances of over striking (flame striking can also be done in an annealing burner).

### Using Livery Ruby To Your Advantage

The “livery-ness” caused by over striking is not necessarily an unwanted effect, just different. By working the ruby in a similar method to Amber Purple, the livery-ness is trapped deep in the glass and can be used as an opaque backing. By burning the livery-ness off the surface similar to “burning off the haze”, you can create a clear ruby over a core of livery ruby. This allows for the outer layer to strike to a vibrant ruby, and because it is backed with the livery ruby, it yields deep opaque porcelain reds. The disk of NS-05 Orange in Figure 1A demonstrates this opaque effect. Note the difference in opacity compared to the disk in Figure 1B. They are both the same NS-05 Orange, but the one in Figure 1B was put into the oven in a clear un-struck state.

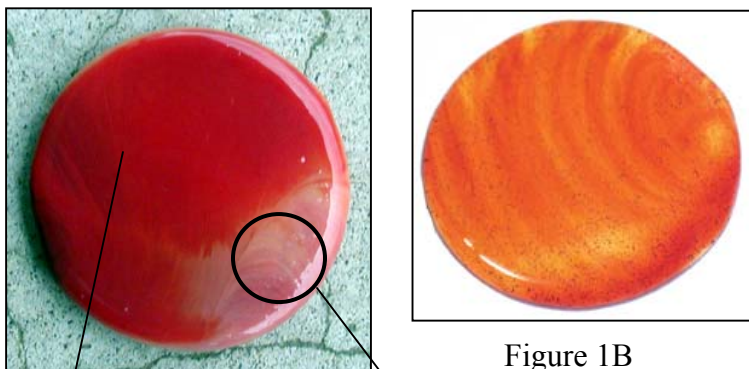


Figure 1A  
Re-struck ruby with core of ‘livery’ ruby

Figure 1B

Livery-ness

### Why We Pre-strike

The ruby glass from Northstar® arrives pre-struck. We strike the entire batch to ensure that it evenly strikes and the batch is as consistent as possible. When using un-struck rubies, one can sometimes look through the end of the rod noting the tint (color), and roughly surmise how long it will take to strike. If the color is pale blue or green, it will take more time to strike than one with a color ranging from a pale yellow to a straw color (note, this method of judging strike time allows for rough estimations only). Figure 2 is an example of different tints rubies can come in.



### Color Tips

With the Northstar rubies, there are many beautiful color combinations to pick from. Some of the classic combinations are NS-07 Ruby over an Exotic and NS-09 Yellow over NS-07 Ruby. Other neat combos include using NS-54 Star White as a backing, layering NS-13 Amber/Purple over NS-05 Orange or NS-06 Dark Orange, layering NS-07 Ruby over NS-65 Cherry, and NS-07 Ruby over NS-41 Butterscotch. In Figure 3 (next page) the three bottles pictured are made from the same base colors. NS-54 Star White, with a layer of NS-07 Ruby all cased in NS-09 Yellow. By controlling strike time and by differing the thickness of the color layers this array of different colors can be produced.

### Conclusion

Rubies are a beautiful family of colors that offer a wide array of possibilities. There are many effects that can be produced, all attainable with experimentation. Go beyond what you know, it is often rewarding! Working rubies is a fine art, not a science, so have fun!





Figure 3

Thanks to everyone who attended the Open House! It was a terrific success and we are already planning the next one! Special thanks to 'Piper' Dan Benway, Shawn Tucker, and Tom Fenn for their demos!





*'Piper' Dan Benway on his Phantom Torch (top) and his piece featuring the new Northstar color NS-66 Sublime.*



*Shawn Tucker on the left in his portable, self-contained workstation. Tom Fenn on the right creating the base for the finished piece pictured at top.*