Devardi Glass And The Hothead Torch
.•:*:•. **Tutorial Series** .•:*:•.

... HOW TO MAKE ROUND BEADS ...

With A Rod Or Stringer And Using The Flame To Round Them

TUTORIAL OVERVIEW…

In this tutorial you will learn to make round beads using a rod or a stringer. Briefly explained, you wind glass around your mandrel into a barrel shape and then shape it into a round mainly using heat, plus a tool where needed. You will see how to use a rod or a stringer to wrap your barrel with.

There are as many ways to shape glass on mandrels as there artists, so I don't claim to have the best way. This is the method I have worked out to consistently round both the stiff and the soft varieties of glass. You can use this method with any brand of glass by the way. Some Devardi glass is soft as butter to work, and some can be more like elastic tootsie roll, so we need a method to shape the glass effectively.

In some cases we need to shape our bead without bringing it to a molten state because of impending devit if that particular glass is overheated. Also, as glass gets close to devit stage in the flame it often gets stiff. Devit means "to make (glass) hard and crystalline, as by prolonged heating". The stage is reached at different points for different colors and varieties.

Within the same glass type (Opaque, Semi Opaque and Transparent) you will find some glass is stiff to work in the flame and some melts easily. This tutorial will teach you to make a round bead with both types of glass by using the flame and your tool (to touch the glass into shape where it is needed).

As a side note, with some of the devit-prone glass colors you can end up with an interesting matt finish. It's very organic looking. A coat of Clear Frit Powder can prevent devit at times.

Because of these considerations I have turned more to the Japanese style of shaping beads than the American way. The Japanese will use a tool right from the start, shaping and rounding and cooling in the process. If you get the chance, be sure to watch a Japanese lampworking video. It can be eye opening to see a different way of handling glass.

Let's talk briefly about Devardi glass in general before we begin. Devardi offers a huge array of colors at fabulous prices. You get intense, color saturated glass that is hand-pulled. The hand-pulling means that rods will come in many thicknesses, some to thick to use directly on a mandrel.

When you want to use a thick rod, thoroughly preheat the end of it in your Rod Warmer and then pull thick stringer (to use like a thin rod). We offer a Tutorial on pulling stringer if you need to learn how, and it's not hard once you get the knack.

If you don't want to pull your own stringer, then buying ready made Devardi Stringer is a great option. And **if you don't have a Rod Warmer,** buying your glass as stringer instead of rods is a REALLY great option, because it will keep you from dealing with shock and shattering.

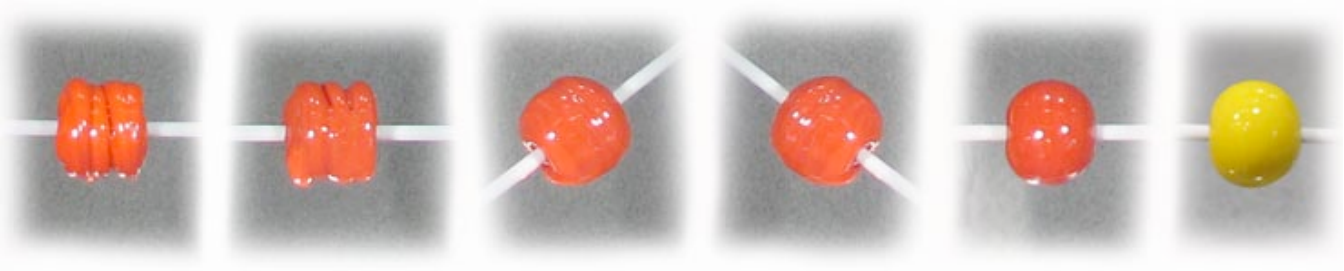
Some varieties and colors will hold their coiled-on shape on the mandrel no matter how long you heat them in the flame. In fact it can stay put until you bring it to a state of devit and then to blistering in the flame. This makes using a tool to shape it an important part of working it. It also makes for promising sculptural use, but that's a Tutorial for another day…

So getting back to the subject at hand… when you wind a stiff variety on the mandrel and heat it, it will glow but not merge, so you should use a flat tool to touch and gently press the coils together and shape the edges into round. The next few pages offer some soft and some stiff glass 'theory'. Both will go into more detail on shaping before we begin the actual tutorial.

On the subject of devit, page 19 of this Tutorial has some neat information on preventing devit using Clear Frit Powder as a thin encasing layer.

.•:*:•. Time Out For Some Theory .•:*:•.

On The **SOFT** Variety of Devardi Glass and Shaping It In The Flame



The definition of " Theory" …a well-substantiated explanation of some aspect of the natural world…"

Let's discuss the theory of shaping a bead in the flame when using soft glass. If you haven't made a round bead before, I would encourage you to stop now and read the steps to the first tutorial and then come back and read this. It will make more sense then.

After you have wrapped your barrel (see the top left picture above) it's time to shape it round using the flame and your tool as needed. This is the point at which you need some 'theory' about shaping soft glass in the flame.

Soft glass will begin to melt, merge and shape easily in the flame. When heated it will melt into itself and will begin to pull toward the center naturally as you steadily turn the mandrel in the flame. On a Hothead, you will probably be working the bead in the flame on the lowest setting most of the time, about 4" from the torch head. This heating will round the edges and draw the glass to the center, creating a round bead. However, if you go to far in your heating - into overheating – it will cause the entire bead to want to slump under the mandrel as you turn and will give you an off-center bead. If you see this shifting and drooping start to happen, move your bead to the side of the flame and continue slowly turning your mandrel, but pause, holding the thicker side of the bead up on top longer as you roll. It may help shift the bead back toward round. Once it cools a bit you may need to re-heat and center it again before proceeding.

Anyway, once you have the bead smooth over it's surface and starting to come to round, you need to move it out of the flame a final time, while still turning the mandrel at an even rate. The tension on the surface of the bead as it cools will help tighten it into a better round as you turn outside the flame.

After you have moved your bead out of the flame (to round it up) and cool it for several turns, you may see that your bead isn't quite round or well shaped. When this is the case you need to re-heat it for more shaping. You can bring it back to a glow and then remove it again, or you can hold the bead below the center stream of the flame, so that the heat hits the top of the bead as you turn the mandrel. Then the core can remain fairly solid and hold it's shape, and the surface is what gets softened and smoothed. This is how you melt in details and dots without causing your bead to shift and lose round shape, by the way.

.•:*:•. Next, Some Theory .•:*:•.

On The **STIFF** Variety of Devardi Glass and Shaping It With Tools

Another definition of " Theory" …A set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted**…"**

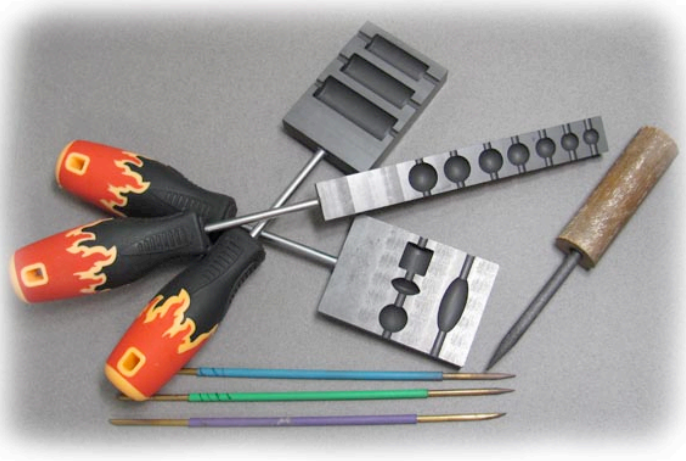
The same 'rounding' tendencies hold true for stiff glass as for soft, but on a lesser scale. When you wrap your barrel shape to begin a bead, don't wait for the rounding in the flame. As you start to roll it in the flame jump in and start shaping with your tool.

I prefer a brass tool for shaping because it can be used to scoot glass over and touch gaps together easily, and this helps stiff glass merge quicker. I also like graphite as a tool because it will smooth rough glass without sticking (just keep taking it out of the flame as you work so that you don't get the graphite so hot it starts to stick to the glass). If you buy a graphite rod to sharpen and use, be sure to set it in a heat-shielding base to hold it with. Graphite transmits heat right now!

Regardless of what you use, when you touch stiff glass with your tool in the flame it begins to flatten and merge, and this is useful to remember and get comfortable with.

We also offer a Tutorial on shaping stiff glass using Graphite Bead Rollers. I strongly recommend using them. They help you bring your bead to round (or your preferred shape) quicker and reduce heat stress on the glass because of it. They also make it MUCH easier to produce consistently sized beads for projects. I use them on soft and stiff glass as a matter of convenience now. Consider reviewing that Tutorial if they interest you.

The Bead Rollers shown below are from CGbeads at www.cgbeads.com but I think that Devardi is planning to offer them at some point. CGbeads has videos showing how to use the Bead Rollers, and they are worth watching if you plan to get one.



.•:*:•. ON THE IMPORTANCE OF A ROD WARMER .•:*:•.

Using a Rod Warmer to preheat Devardi glass rods makes all the difference in the world in preparing them for the flame, so if you don't have one, I STRONGLY encourage you to get a Rod Warmer. They are not that expensive and they are available from Devardi or can be purchased online from Beauty Supply sites (they are called Ceramic Heater Stoves).

A Rod Warmer reaches 800-900 degrees, so you will rarely ever experience shock or shattering if you use one. Some people use a small Teflon coated Grill or Hotplate successfully by spending the extra time to make sure the rod is heated slowly in the flame at the start, but these don't come near the temperature of a Rod Warmer.

You can take the time to wave and roll your cold rod in the high, back-end of the flame to warm it, and then ever-so-slowly bring it forward, rolling and heating it until you can bring it into the actual working area of the flame, but most people don't have the time or the patience to do this successfully on each rod. And it's really not cost effective to spend your time this way either. Even after doing this some people still experience shock or shattering, despite their best efforts to adequately pre-warm rods.

About my set-up… As you can see in the picture above, I use a medium-sized nut can (from Walmart) turned upside down to rest the ends of the rods on. It is just the right height and width. The Rod Warmer gets very hot, so I wrap a piece of Fiber Blanket around the cord at the back to act as a heat shield between the Rod Warmer and the cord because I have the Rod Warmer in the back corner of my worktable. Ceramic tile is behind it.

Devardi offers an inexpensive steel plate for the inside bottom of the Rod Warmer. It will protect the bottom from glass rods that get put back in the Rod Warmer to hot. They can stick to the ceramic bottom and sides if you touch them together in a molten state, so be sure to roll your rod and cool it before returning it to the Rod Warmer. The top of the Rod Warmer makes a great surface to preheat Murrini on before applying them. I have the Murrini sitting on a small piece of steel plate, also available from Devardi.

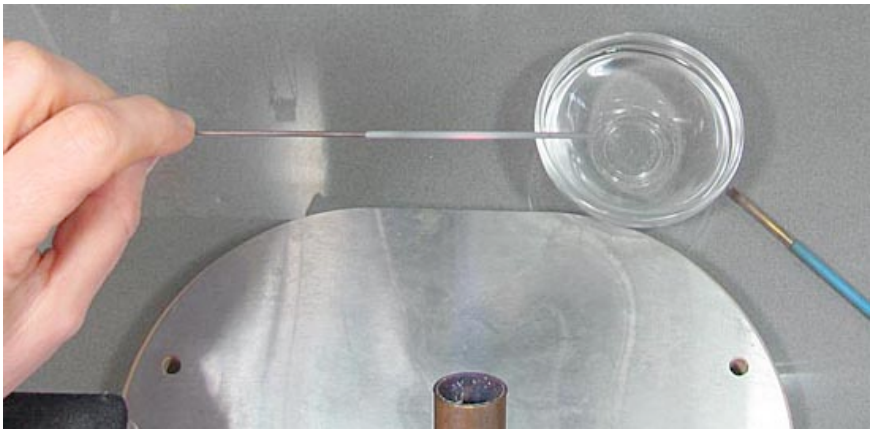
To work Devardi glass with the greatest ease and productivity put your rods in the Rod Warmer about 2" to 3" deep. You only want to preheat the rod end, so that you can hold it normally and work it in the flame. When you first turn on your Rod Warmer plan to preheat your rod(s) for 5 to 10 minutes before you use them. Then, after each use, roll the tip of the rod on your marver to shape and cool it before you return it to the Rod Warmer. A glowing rod end will stick to the Rod Warmer and to other rods. Keep returning the rod to the Rod Warmer so that it is ready for the next use. Cool rods can be put into a hot Rod Warmer without shock, and used once they are fully warmed (about 5 minutes on average).

.•:*:•. HOW TO MAKE A ROUND BEAD .•:*:•.

Using A Rod, The Flame And A Tool

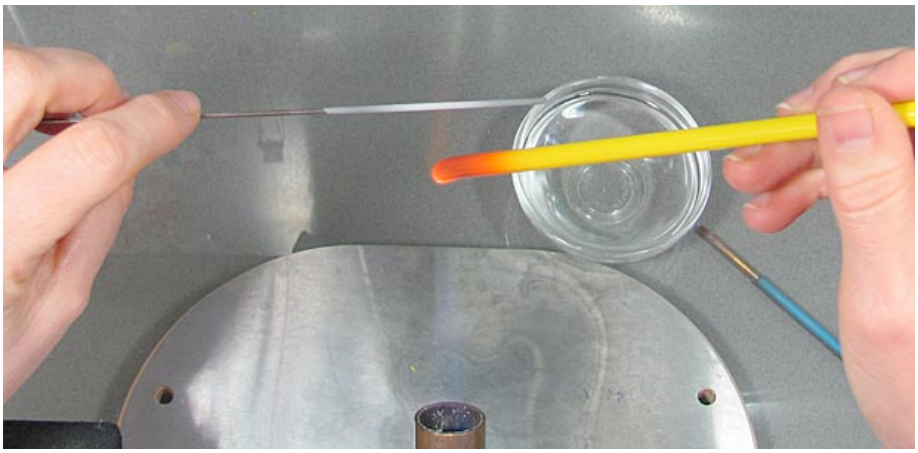
WHAT YOU NEED TO BEGIN…

Rod Warmer
Hothead Torch
Mandrel dipped in Bead Release
Brass Tool (or shaping tool of your choice)
Cooling Rack and Marver
Rod or thick Stringer of D108 Opaque Lemon Yellow
Bowl of Distilled Water (Distilled Water helps keep minerals from building up on your tools)



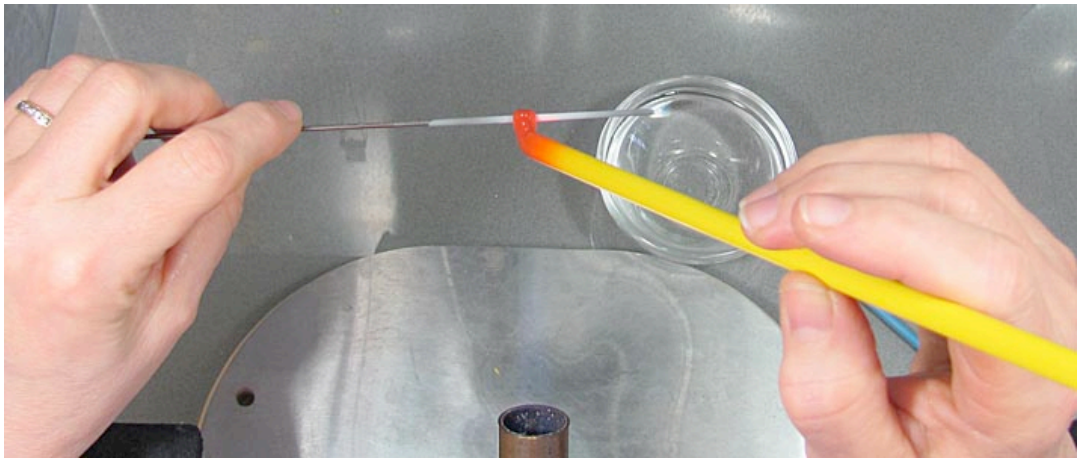
STEP 1. Light your torch and let it warm up a bit. Then adjust it to the lowest flame possible. You want your Hothead torch set to the lowest flame it can be without going out. You should be able to hold your hands (and work) 2" to 3" from the sides of the flame when it is set low enough. As you read through the steps notice how far the rod is from the torch head in the pictures. It is about 4" from the torch head to the rod tip in this first picture.

Spend time rolling and heating the coated end of your mandrel from end to end and bring the center to a soft glow before you apply your glass. This will prepare it for the glass and will help prevent air bubbles from developing from the gas of uncured/thoroughly dried bead release.



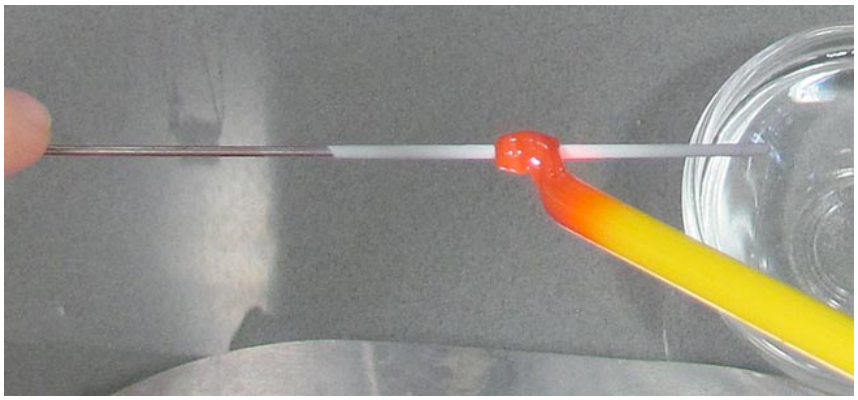
STEP 2. Next, take the pre-warmed rod from the Rod Warmer and dab 2" to 3" of it in and out of the flame - about 4" to 5" above the torch. Point the rod end forward (away from you) and dab it in and out of the flame a few times to be sure it is fully pre-warmed. Then begin to roll about 1" of the tip in the flame. You'll see the sharp edges of the rod begin to soften and then glow when it's ready to be worked.

While you do this you should be holding the mandrel farther out in the flame to keep it warm as you bring the rod to a glow. If your mandrel isn't fully heated your glass won't stick to it.

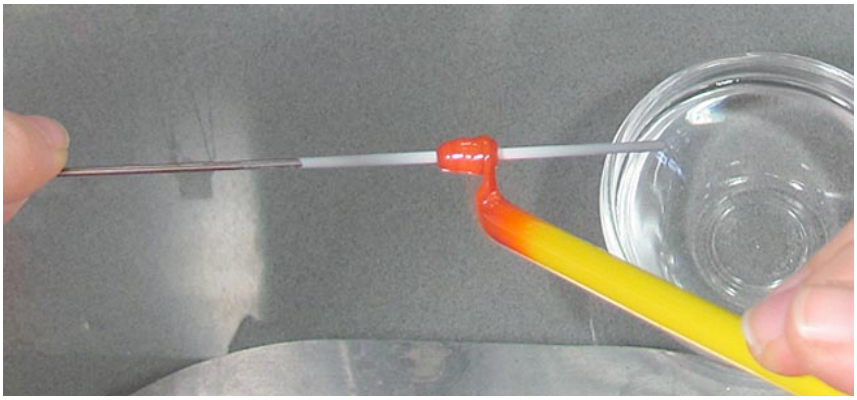


STEP 3. When the end of the rod is glowing, set the tip of it in the center of your mandrel and slowly roll the mandrel in the direction that is up and away from you. If your mandrel is hot enough it will stick and you can gently pull the glass a bit to stretch the glass away from the mandrel. This will give you a thinner length of glass to wrap around the mandrel.

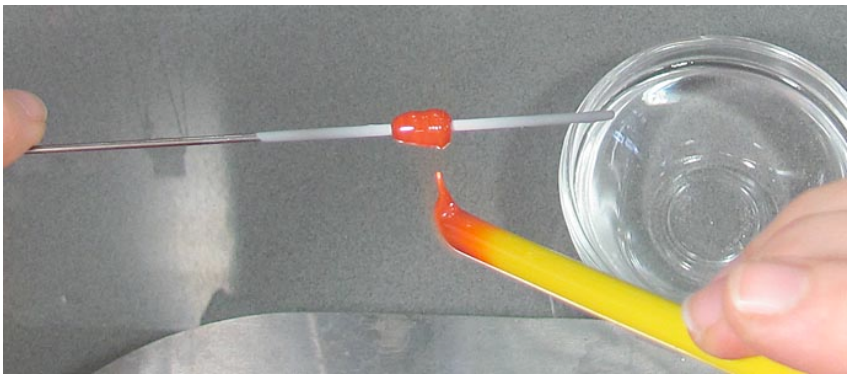
Wrap a complete ring around the mandrel before you start leaning to the right for your next coil. You want to be careful with this first wrap and have it make a full, even circle. If it isn't round and smooth around the mandrel you cannot fix it, and your bead hole will not be round. If this happens, flame-cut the glass off and put your mandrel in a pot of water or where ever you put mandrels if the bead release breaks, and then start again with a new dipped mandrel.



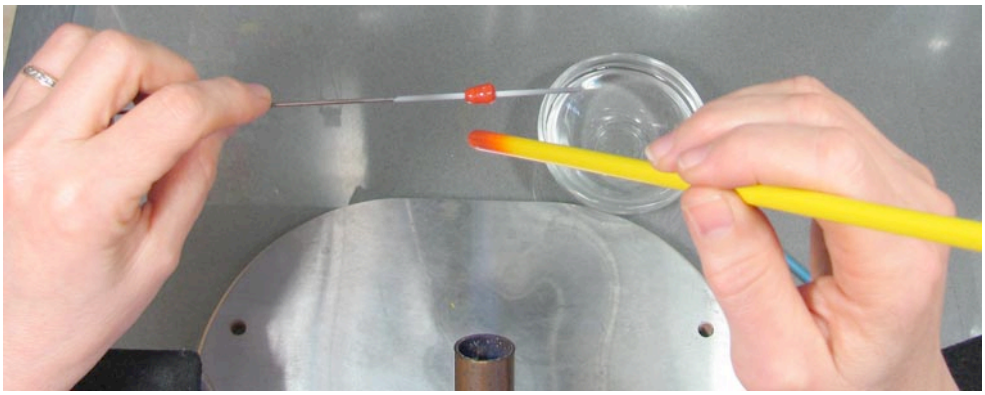
STEP 4. When you have made the first full wrap with a gently stretched length of glass, move to the right and lay your next coil right along the first one. You want to keep them the same thickness as far as possible.



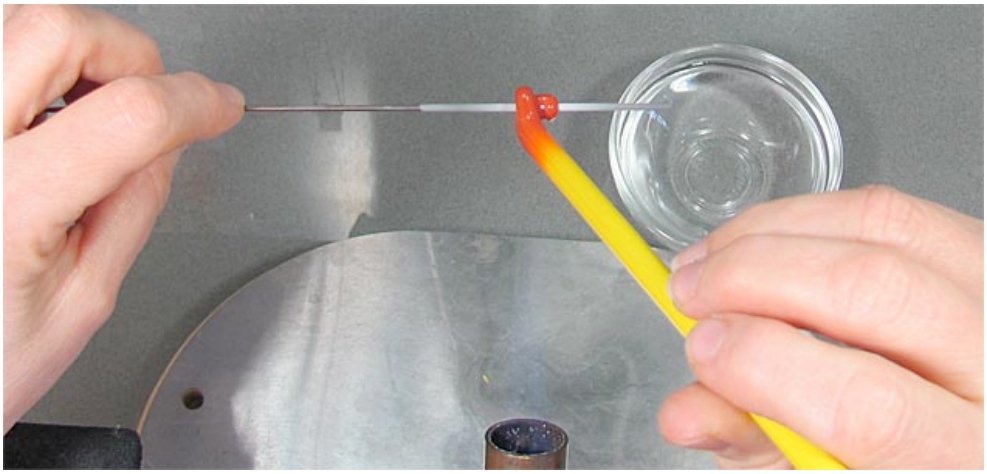
STEP 5. Make 3 or 4 complete coils around the mandrel in this way. On your last coil, as you are almost finished with it, stretch the rod away to flame cut it. Stretch the rod and continue to slowly roll your mandrel as you wrap the fine strand of glass on it. In this way you won't form big ridges.



STEP 6. You should be in the flame, about 3" to 4" from the torch as you cut this last wrap.



STEP 7. Now re-heat the end of the rod back to a molten state (for soft glass) or to slightly glowing (for stiffer glass) before you start again.

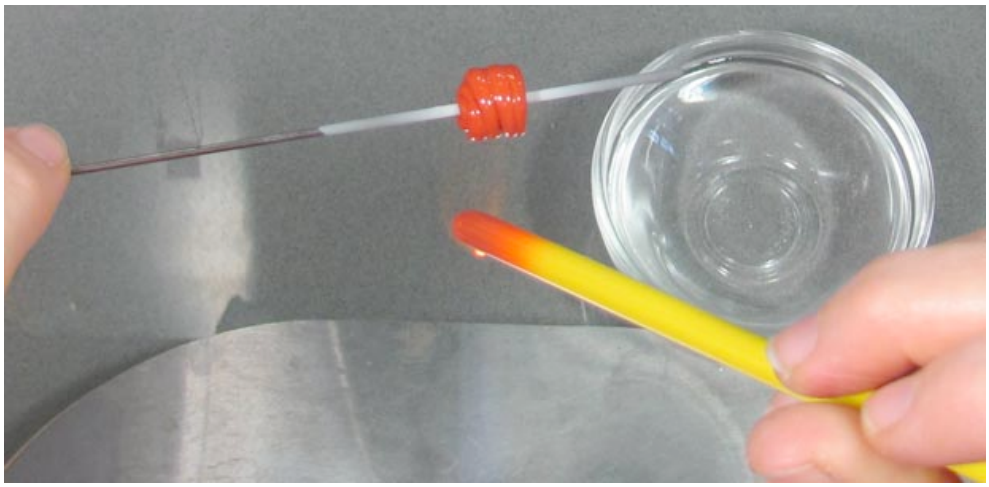


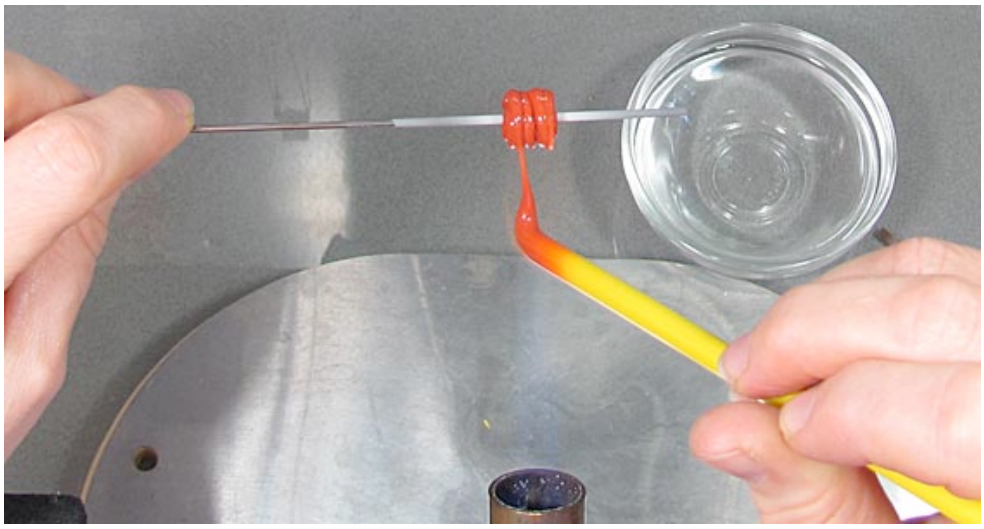
STEP 8. You are going to wrap another layer in the same way from left to right. You will make a total of 3 layers to form your barrel shape before rounding it into a ball.

STEP 9. Just like before, at the end you need to stretch the glass to a strand during the last wrap to make a smooth round finish to the coil. Then flame-cut it off. Now repeat and add the third wrap (and do a fourth one if you wrap tightly and thinly). **You want your barrel to be just a little longer than it is square in dimension on the mandrel,** to have enough glass to make a fully round bead.

A NOTE ON GAPS: If you see that your coils have gaps between them (after you get done making a complete wrap and flame cutting the glass off) stop and heat the bead and smooth the gaps together using a tool and/or your Marver. Then start your next wrap.

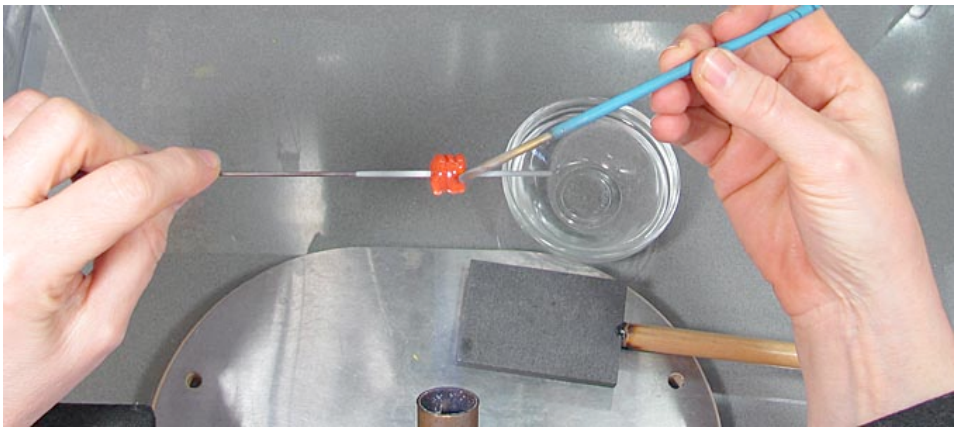
If you don't close the gaps you risk trapping air bubbles, which can rise later and ruin your bead. You don't need to do a perfect shaping when you close your gaps, just smooth the coils together, but do keep the barrel shape.



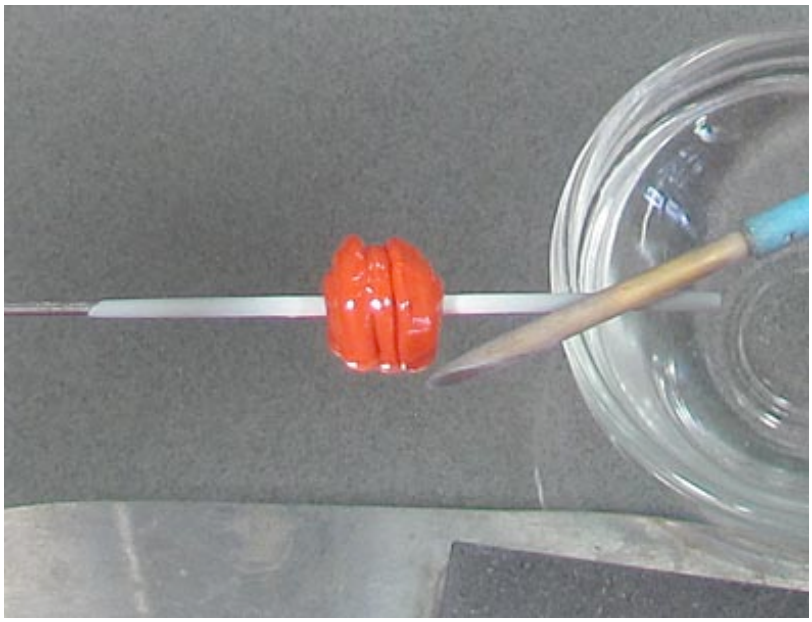


STEP 10. Once you have enough wraps or layers on the mandrel to make your barrel, go back and look at your left edge and see if some part of it has a slant – like in the top picture above. Check the right side too. If it does, heat the rod tip to glowing and gently stretch on a careful swipe to give this area the glass it needs (see the bottom picture above).

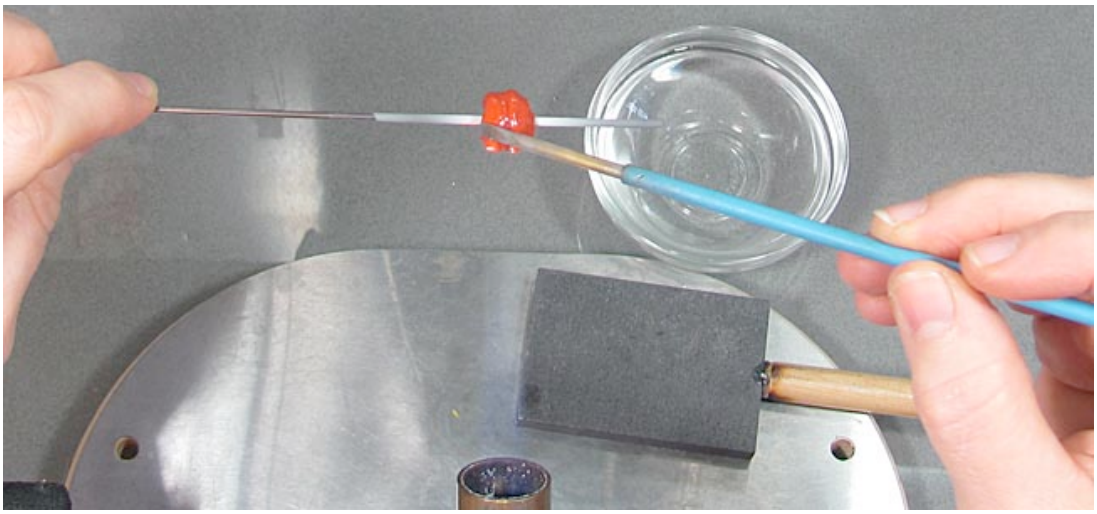
If you find you have trouble using a rod and stretching glass or applying small amounts to repair an area, then realize that you can pull thick stringer to use, or buy matching stringer for such need. If you want to learn to pull stringer we have a Tutorial on how to do it.



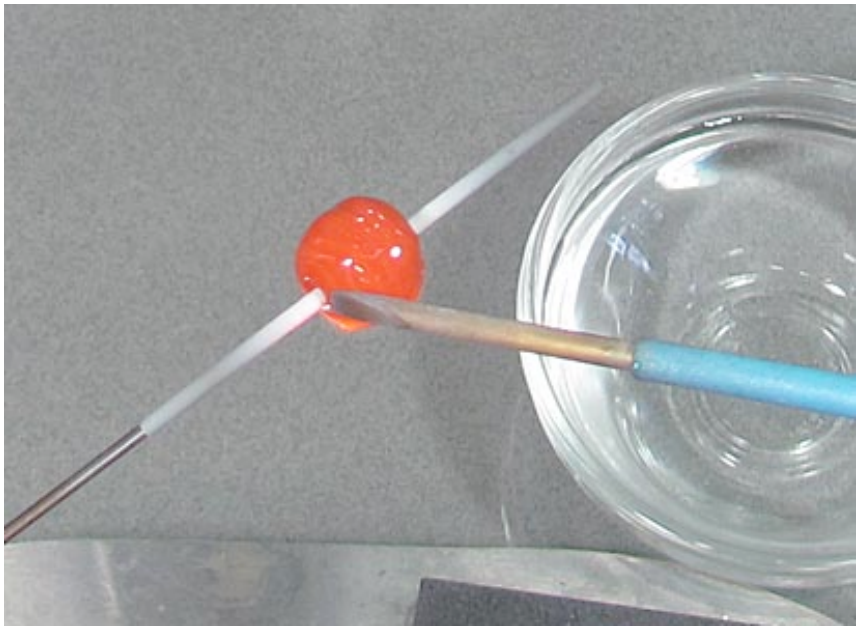
STEP 11. Once you have the barrel made, continue to turn your bead in the flame, and start to use your flat tool to **gently** press the right rim in toward the center to help the side become round. Do this all the way around the bead. Dip your tool in the quenching water every press or two so that it doesn't get to hot and start sticking.



In this picture you can see the right side of the barrel after being gently pressed toward the center all the way around. You may cause new ridges as you shift the outer edge, but you will repair them and continue the process of touching with your tool and helping the glass merge as you go.

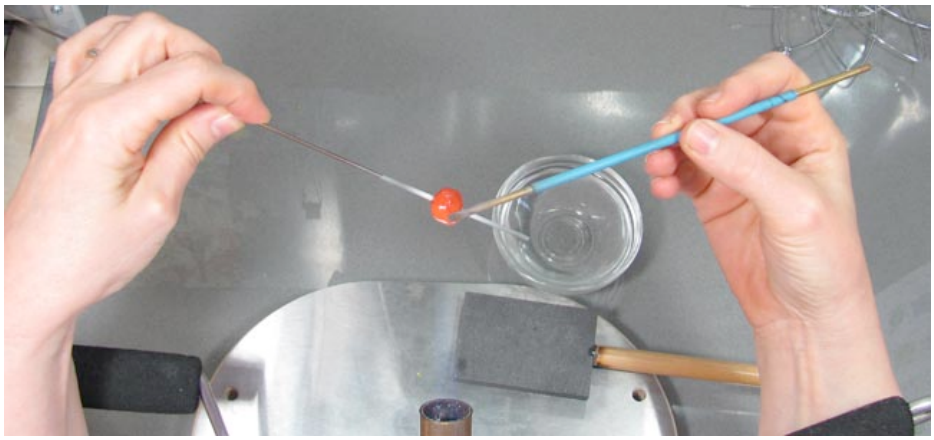


STEP 12. Now begin to gently press the left rim/edge of the barrel toward the center as you make small turns with your mandrel.

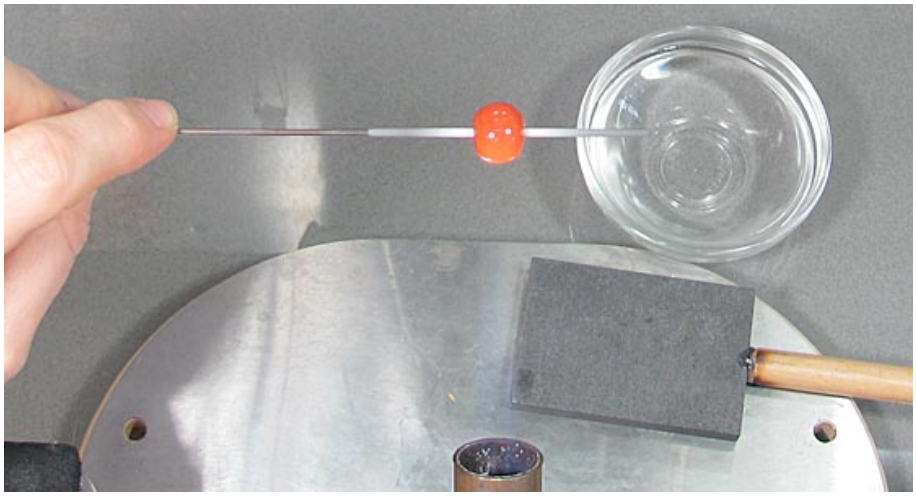


STEP 13. Next, angle your mandrel so that your tool can gently press close to the mandrel where there are ridges to be smoothed. Just touching with the tool will help merge gaps and wrinkles. Touch with your tool wherever you find 'crinkles' or areas not merging in the flame.

This glass is smoothing out as it is softening, but some stiff glass will stay wrinkled-up until you have gone over it with your tool in the flame.



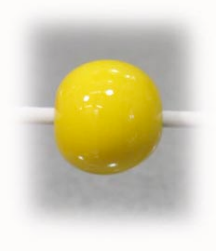
STEP 14. Angle your mandrel and use your tool to touch around the mandrel on the right side as well (if it is needed). You need to check the area around your mandrel on both sides, and smooth them if needed before your final heating and rounding. Your sides must be without crinkles or ridges before your final shaping.



STEP 15. Once you have gone over your bead with your tool, and touched and shaped as needed, it is time to roll it in the flame for a final polishing and rounding.

Slowly roll your bead directly in the flame and bring it to a glow. As it starts to round, lower it to the side or below the flame to allow the cooling surface tension to help it come to round.

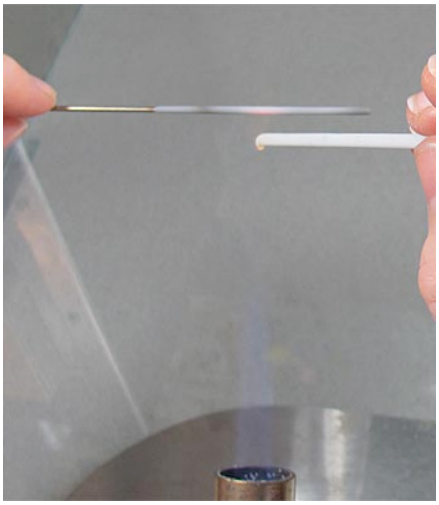
You do need to watch it so that it doesn't get to cool and change color to far. Just make several turns watching as it rounds. Repeat this process of heating and cooling outside the flame if it isn't quire round. When it is a nice shape bring it back into the high part of the flame and check your work, and then garage it in your bead kiln (or your Annealing Bubbles or Fiber Blanket or Crockpot). Good work!

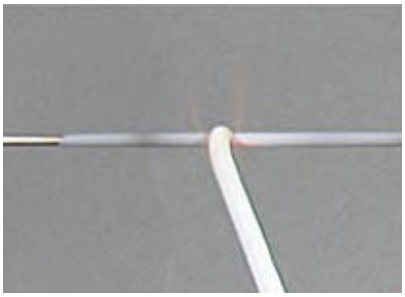


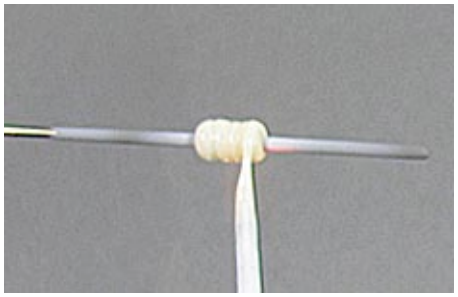
.•:*:•. HOW TO MAKE A ROUND BEAD .•:*:•.

Using A Stringer And The Heat Of The Flame

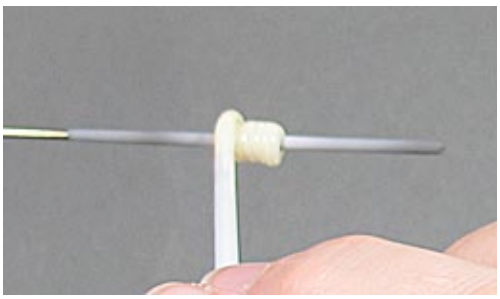
Now that you've seen the steps to make a round bead using flame and your favorite tool, let's see it done with a stinger and nothing but the flame.

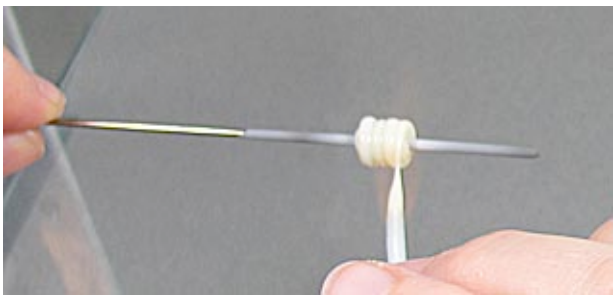




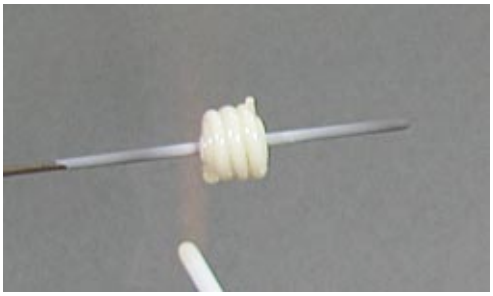


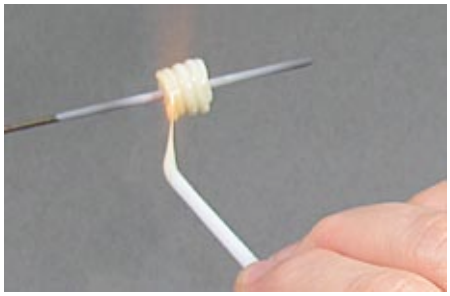
STEP 1. Pre-warm your mandrel until it glows and then gently heat the end of your stringer. Touch the tip of the stringer on the mandrel and begin to coil it, turning the mandrel up and away from you. Make 4 complete wraps close together and then stretch and roll as you flame-cut the stringer on the last round.



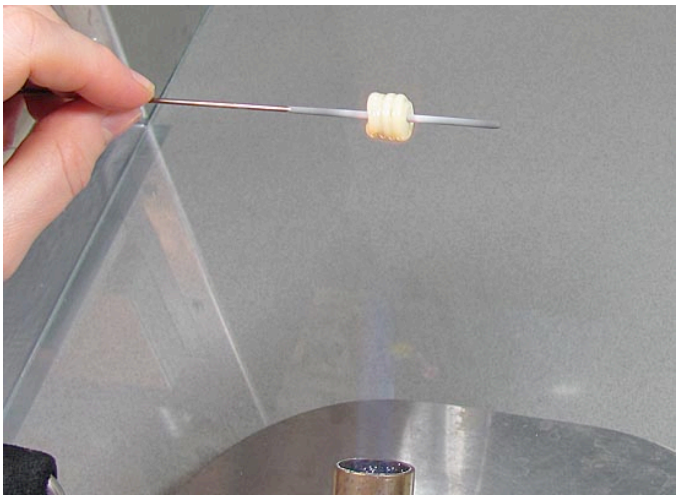


STEPS 2. & 3. Preheat the stringer tip and start your second wrap of coils. Stretch-cut it as you go completely around on the last coil. Repeat again to make your third and final wrap



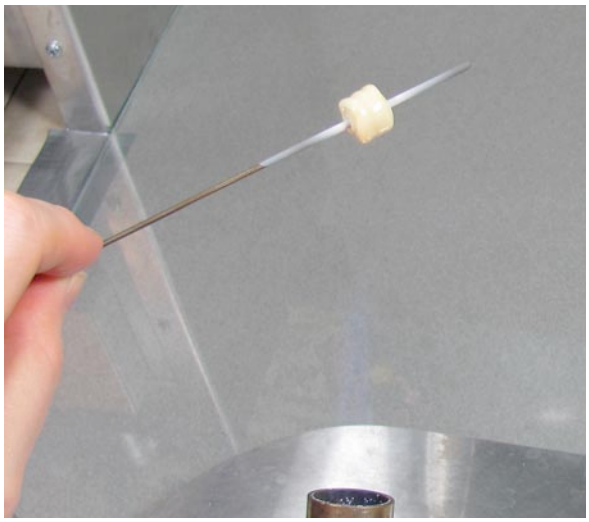


STEP 4. Check your left and right edge for a slanted area around the rim. Heat the tip of the stringer and apply a swipe of glass where needed. Stretch to flame cut it off.



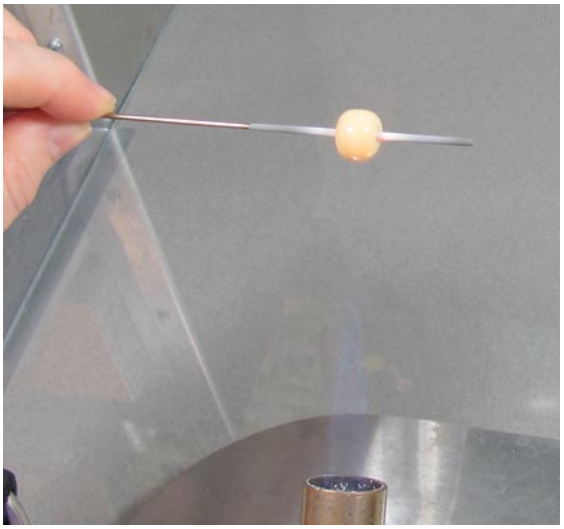
STEP 5. Slowly turn your barrel in the flame, about 3” to 4” from the torch head. Bring it to a gentle glow as you start to soften the coils and the edges of the barrels.

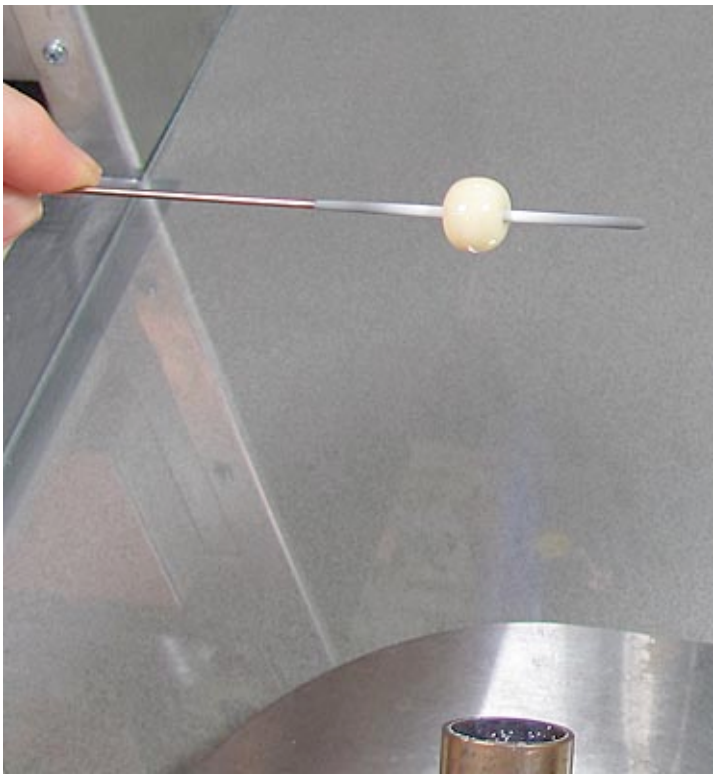
Hold your mandrel level as you turn it. The mandrel in the pictures below is level, but angled.



STEP 6. Slowly roll the mandrel and angle it in order to roll it in the left edge in the flame. You are softening it and forming a smooth edge around the mandrel. Repeat for the right side. This heating is to make the sides around the mandrel smooth and nice. Keep the mandrel level as you angle and turn. The mandrel doesn’t look level in the pictures but it is most of the time.

STEP 7. When both sides are smooth around the mandrel return the bead to the center of the flame, about 4” from the torch head. Roll it slowly and watch it start to come round. When it begins to come to a nice round shape it is time to remove it from the flame, yet keep rolling at the same



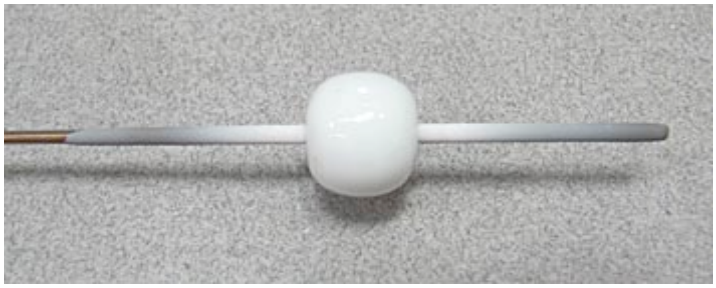


STEP 8. Move the bead to the left of the flame and continue to roll. Watch the bead round more as it starts to cool. Don't let it get to cool, but do allow it to firm up and round.

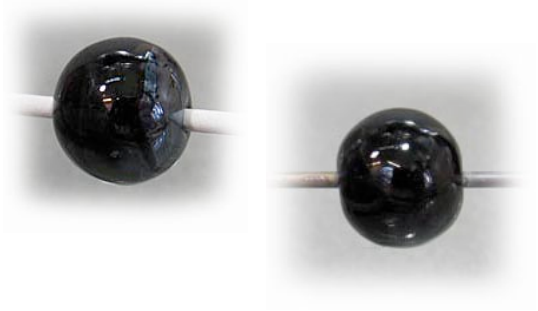
If you need to, repeat this step to get it to come to a better round shape.

Depending on the amount of glass in your barrel, you will get slightly different 'round' shapes. Remember that glass wants to go into a donut shape, so wrapping in the barrel shape gives the best chance to end up with a close-to-round bead without a Bead Roller.

As you decorate your bead and heat your designs in, glass will continue to try to migrate toward the center. This bead will end up more round with additional work.



Round is definitely the way to go…
in fact there's no end to what you can do with it!



.•:*:•. Opaque High Density Black & Your Hothead Torch .•:*:•.

This has been a long Tutorial, but I want to add one last thing about working with Opaque High Density Black on your Hothead Torch. Sometimes you will end up with a metallic sheen on your black bead, as you can see in the top picture on the left.

To remove this sheen, after your bead is annealed and cool, clean it with Tarnex and then wash the Tarnex off well and dry it. This simple treatment is useful to know, especially since black is such a nice base color to work with.

.•:*:•. Round Possibilities.•:*:•.

The froggie's base bead was made with Transparent Cranberry. Sterling silver wire was melted on to make the silver dots on the surface of the bead, like the bracelet on the first page.

Now that you can make round beads with consistency just think of all the designs you can make! You can use frit, draw designs on with stringer, make dots and create combinations of design that interest you… the possibilities are truly endless.

In closing, here are 3 bracelets decorated with frit, stringer work and dots. If you like their design feel free to make them up for yourself or to sell. Our tutorials always allow you to make and sell any item or pattern shown.

To assist you with frit, stringer and dot work, here are a few pointers (if you need them). And realize that there are many ways to work with these applications, so this is just one way. Remember to experiment with the colors and techniques that interest you BEFORE you jump into a full project. Some glass will hold up in the flame and some won't. Some will fight with it's neighbor and some works great together. Make test beads and anneal them before you create an entire project to avoid frustration and loss of labor and glass.

To draw with stringer, gently preheat the working area on the bead surface and the tip of your stringer, and then set your stringer on the bead – holding it to the right side of the flame to begin.

You want to find the place beside the flame that causes your stringer to relax just enough to draw with it. Move closer to the flame until you feel the slight 'give' start and then get busy drawing! When you find this special 'spot' near or in the flame you should be able to put gentle pressure on the stringer to draw as you like (while it stays stiff in your hand) yet glides onto your bead at the tip – not to hot, not to cool!

The Stringer and Dot Bracelet was made using Opaque Burnt Carrot Orange and both Medium and Dark Brown for the beads, with Metallic Silvery Black use for stringer and dot work.

To make dots, gently preheat the working area on the bead surface, and then preheat the tip of your stringer to form a tiny dot on it. Then set the dot on your bead where you want it, moving closer to the flame to cut it as you pull the stringer away. Once you have applied your dot(s) be sure to reheat the dots in the flame. Heat them enough to 'seat' them on the bead so that they don't pop off, or have undercut area that can get hooked on something.

If your glass stringer is to stiff to form a dot on it's tip, then heat the tip and set it on the bead and flame cut as you pull. In this case, press the stringer to the bead to get the size dot base you want, and pull off slowly or quickly to leave the amount of glass you want in the dot. Put the dot right back in the flame to round it if you are using a stiff glass.

You can go back and touch a cool dot with a hot stringer tip to add more glass to the dot. If you do it the other way around you remove glass from the dot.

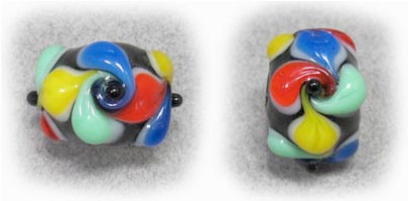
The Dot Bracelet was made by using different Devardi transparent colors with effetre dots applied afterward. If you want a creamy melt to your dots without tool work, Moretti/effetre melts nicely across Devardi glass.

The Frit Bracelet was made using Semi Opaque Lt. Baby Blue with a 96 COE frit that was melted on and then raked. The bicone beads were made with Transparent Vibrant Blue.

Frit comes in different COE's. Typically 96 COE frit is more vibrant in color, but use it sparingly (use 10% or less compared to the size of your bead). Devardi is 104 COE.

To use frit, make your bead and then roll it in the frit of your choice. Put the frit in a large spoon and hold it under the torch to set your hot bead in, or put it on your mandrel and roll your hot bead on it. You can use whatever method you like.

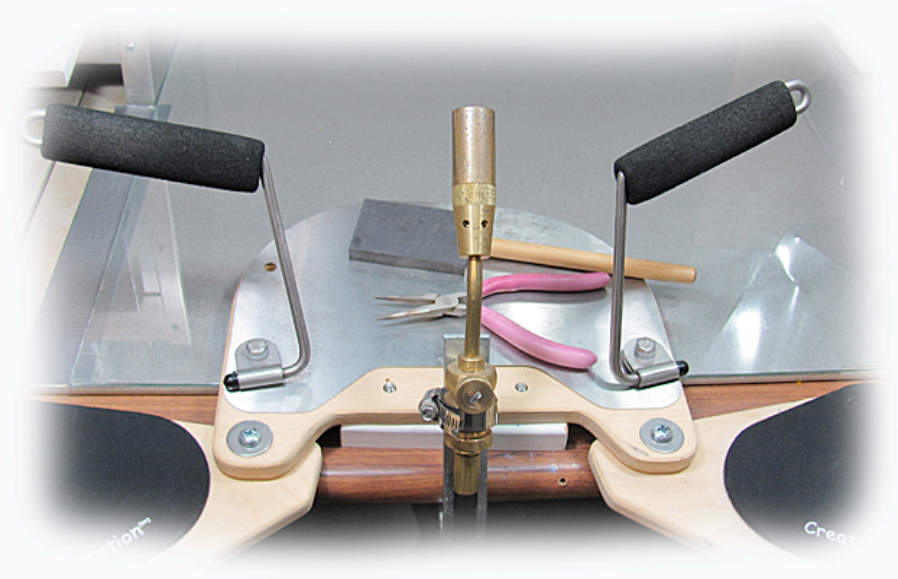
Once you have the amount of frit you want on the bead, press the frit flat with your tool as you gently heat it in the flame. Add a layer of clear powdered frit and melt it in if the frit or glass is prone to devit. To rake the frit, heat the bead to a gentle glow and use your pick in the flame to hook just the surface of the bead's frit and roll your marver slowly but steadily away from you, raking the frit in the flame as you turn. When you have raked all the way around, lift the pic and stretch/flame-cut the glass that was hooked off. Put your pic in cool water to shatter off any glass that adhered. Gently flame-polish and shape the bead.



A Note On The Benefit Of Using Clear Frit Powder Between Layers…
Devardi glass likes to be worked cool in the flame. Some colors want to be heated without ever getting to molten stage, or they may devit. I have found that after shaping the bead, if I roll it in clear frit powder and then melt it in I can then work the color much hotter in the flame, and I can stack colors, adding a layer of the clear frit powder between each stack if needed. Experiment with this and see how you like it.

The multi-colored twisted bead was made with this method. The base is Opaque High Density Black, with base dots of SOP Moonstone White, and then dot colors in Transparent Cranberry and Cobalt Blue, SOP Lemon Yellow and a Green. I had to press the dots flat and shape them because they tended to stiffness, applying clear frit powder with each new layer. Finally, I raked the edges of the dots toward a center point, and then used the blunt end of a clear stringer to twist them, and applied a dot of Opaque High Density Black on top. Fun! Now you go experiment!

.•:*:•. About My Lampworking Set-up .•:*:•.



You might be interested to know what the black bars are in the tutorial pictures. I use a 'Creation Station' for elbow and wrist rests. I find it makes all the difference in keeping a steady hand when applying fine detail.

I use bulk propane with my Hothead Torch. I have a long hose that goes through the wall to the 5-gallon propane tank. I am careful to thoroughly clear the gas out of the hose after each use of the torch. This has stopped the problems I originally had with spitting and gunk in the line.

Please note that I show the Hothead Torch in each picture so that you can refer to the location of it as you work (especially if you are having a problem with any given step). Realize that you are looking down at the torch, so you can't see what is below the flame and what is in it. I try to state where to hold things when it is important to the step.

These tutorials were made using a Hothead Torch, but any torch can be used. If you are on a surface or pre-mixed torch you will need to make adjustment for the significant difference in heat that it produces. For example, you will not be able to use your tools directly in the flame as you can on a Hothead Torch. You must work to the side of the flame with tools. A Hothead Torch is much cooler than other types of torches.

Please feel free to email me at FineFolly@bellsouth.net if you have questions. I always like to help if I can!

Annealing Bubbles versus a Fiber Blanket or a Crockpot of Vermiculite

If you do not have a bead-annealing kiln to put your work in after you finish it then you probably use either Fiber Blanket or a crockpot full of Vermiculite, or what are called Annealing Bubbles.

I have used each one of them, and for the size beads I tend to make I found that the Annealing Bubbles were more effective at slowly cooling my beads. I used to wrap my crockpot in a fleece blanket while set on high to let my larger beads cool, and then turn it off after a few hours, but that is not recommended and can cause your crockpot to overheat, as you can see by the faded paint on the crockpot in the picture above!

But even the Annealing Bubbles are inadequate for all but smaller beads, when it comes right down to it. If you continue in lampworking you need an annealing kiln.

Devardi plans to offer a Rod-Warmer sized mini-kiln soon. Look for it as the least expensive option to anneal and cool beads. Another option you might like to know about is The Glass Hive. They allow you to put a kiln on layaway and take as long as you like to pay it off, and that is what I did. You can see their 'Short Guy' kiln in the picture above. It's a great little kiln. The Glass Hive is online at www.theglasshive.com if this interests you. They frequently have sales where they reduce the price or pay for the shipping.

To locate Annealing Bubbles, do a search for 'Annealing Bubbles' online and find the best price for them in the large Tin. They need to be in metal to work best and the larger Tin lets you put many beads in it during a work session at the torch. The supplier I got them from is www.artcoinc.com