flat-bed kiln murrine

level 1

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level one

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murrine cooking!

Video timestamps
https://youtu.be/ih-n29FOBUc

intro

Welcome to the place to play with flat-bed kiln murrine!

Why make your own murrine?
Because its fun creating your own designs! It can be quicker and cheaper than buying them… and did I mention more fun? Or make something bespoke that matches an existing item. You wont need to buy a special kiln for murrine.

Murrine, murrini, or murrina...
refers to decorative patterned slices cut from a glass cane, often featuring designs like flowers or animals, which were originally used by the Romans! The term, popularized by Venetian priest Vincenzo Zanetti, identifies these slices and the resulting mosaic-like glass objects, such as vases and tableware, that are created by arranging and fusing them together.

Each project has been organised by ease and speed of assembly so you can increase your skills at your own pace. All you need is access to a flat-bed kiln and basic household and glass fusing materials

SAFETY

- Min. age 16 + due to small sharp glass pieces. Keep away from smaller children.
- Glass dust is hazardous; keep away from food / drink.
- Cut glass inside a clear plastic bag where possible
- Handle gently. Rinse itchy hands or cuts gently with cool water to avoid embedded shards.
- Wash hands before and after touching glass.
- Work over white paper to see the shards and to remove shards.
- I've not tried microwave kilns for this, and do not think they are useful for any designs, except the simple bee or ladybird, using coarse frit or cut rods, in the level 1 starter technique.

tools and materials

The Glass
CoE 90 and CoE 96 glass tested well
- 2mm stringers in CoE 90 is more widely available and useful for Bee and Chunky flower.
- Float glass needs checking with maximum stainless steel temperatures.

- 1–2mm stringers
- 0.5mm stringers for filling in detail
- rods, approx. 6mm
- ribbons
- coarse frit
- vitrigraph cane scraps (e.g. Tabitha's Glass Emporium)

When designing, keep in mind that glass behaves differently. For example, dense white melts less readily. Also bear in mind reactions in glass, such as lead, copper, sulphur or selenium. This can happen with a mixed colour pack of stringers, and you don't know the exact colours. Strikers hiding in a mixed transparent pack benefit with a tack fuse to reveal true colours before making cane.

Ceramic Lining Options:
1st choice: Fibre blanket/paper
- 1-3mm thick: line it with **Bulleseye Thinfire** paper or similar. It lasts a few firings and cushions the stringers well to prevent breakage when placing in the mold.
- Better for holding shape and creating a round cross-section.
Limited results: Papyros paper *(new organic version)*
- 2 layers retains some structure, but more likely to be bumpy and oval.

Molds:
- Best choice:
Stainless steel metal strips bent into an 'M' shape (eg. flimsy cookie cutters lined with kiln paper (described overleaf).
~~ Make sure they are unpainted and clearly named as stainless steel ~~
Best for shaping a nicely rounded cane. (link in resources)

- Not highly recommended:
Cylindrical kiln feet or zigzag metal molds

Other tools:
- notebook to log materials used, firings and results
- cocktail stick, tweezers
- disposable or work gloves
- heavy duty kitchen scissors, flat nose pliers
- craft knife or fine scissors to cut away taped cane
- glass mosaic cutters and clear plastic bag to cut in
- ruler
- glass marker pen
- thin clear, cellophane based, (not plastic) tape such as Sellotape or Scotch tape:
    - For simple designs in Level 1, a 12 or 15mm width is fine
    - For the Level 2 course, 10mm is good
    - tape dispenser is handy

mold choices

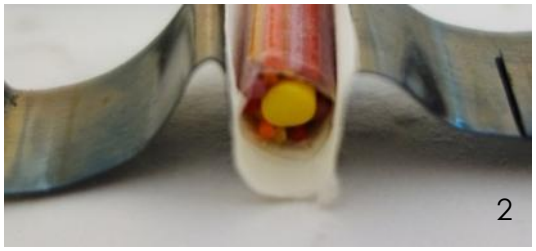
Best choice: Stainless Steel Strips:
- Cheap, flimsy stainless steel metal cookie cutters were easiest to source, cut and bend. They are likely to be 26-30 gauge steel. If the cookie cutters are really cheap, pliers might pull them apart easily!


1

- Stainless steel foil ...
is difficult to source because metal hardness is rarely specified. 26 gauge (0.018 inch/0.46mm) is likely to be less bendy than the thinner 30 gauge.

- Kitchen scissors (favourite), tin or wire cutters can cut the steel.

In pic. 2, they are bent into an 'M' shape with pliers and gloves, curved into a circle for the murine to sit. In picture 3 they are wrapped tightly to form a circle.
- A strip underlying the mold is handy for transporting the mold in and out of the kiln. This helps to keep the fibre blanket intact and reusable (pic4). Use a zigzag mold for underlying support if you have one...


2


3


4

***Less desirable* with limited results:**
Cylinder Kiln Feet and metal zigzags

Tests resulted in only oval shapes:
- Possibly useful for the 1.5 Random shapes
- Cylinders needed a gap and kiln blanket.

metal mold making

TOOLS

- Heavy duty kitchen scissors cut better than some tin cutters, and work well for flimsy cookie cutters.
- a chunky felt pen or brush handle
- Flat or round nose pliers

METHOD

- If the cookie cutters are only crimped together, they could be opened by pliers (mind the sharp edge, wear gloves if needed). Otherwise, cut open.

Cut:

- 25% into 9-10cm lengths, big enough for side wings
- 60% into 7cm lengths for middle support pieces (pic5)
- 15% into 10cm for an underlying long straight strip. This keeps the fibre blanket from falling apart when lifting.

10cm underlying strip flat at ends, 'U' curve in middle

Shaping :

- Bend the middle curve approximately 9mm wide using a curved object like a round felt or brush handle. Thin or rounded pliers also help to shape it more. (Pic 3)

- The 'M' Shape

Bend the strip into an 'M' shape. The sides of the 'M' shape don't need to be perfect, as long as a few of them are long enough to stabilise the mold from rolling over in the kiln. Ensure the longer ends of the 'M' are turned up so that they don't poke and dig into the kiln shelf (pic 4)

- Smaller support strips

Smaller leftover pieces are good for middle support-pic5

1

2

3

4

5

tip

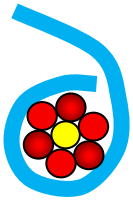
MOLD LOADING:

- Metal strips are best placed under the murrine at least 5mm apart to avoid dips in the finished cane.

- Metal needs to curve as far up the cane as possible (90% diameter cover) for a round cross section (pic 6)
- Cut the ceramic fibre paper or blanket 5mm longer than the cane and at least 90% covering, like the blue circle.
- Squeeze the metal as firm as possible to enclose the cane and place in the kiln

6a

6b for canes less than 6mm diameter, eg 1.8 chunky candy with only 1mm stringers, try squeezing the mold tighter:



glass techniques

The kiln programmes:
I used Skutt Firebox 14 and 8 and the normal Bullseye firing programmes. Some kilns are warmer than others, so your experience and testing is helpful.

Cane Firing Rates		
5cm length	10cm length	14.5cm length
Fast	Medium	Slow

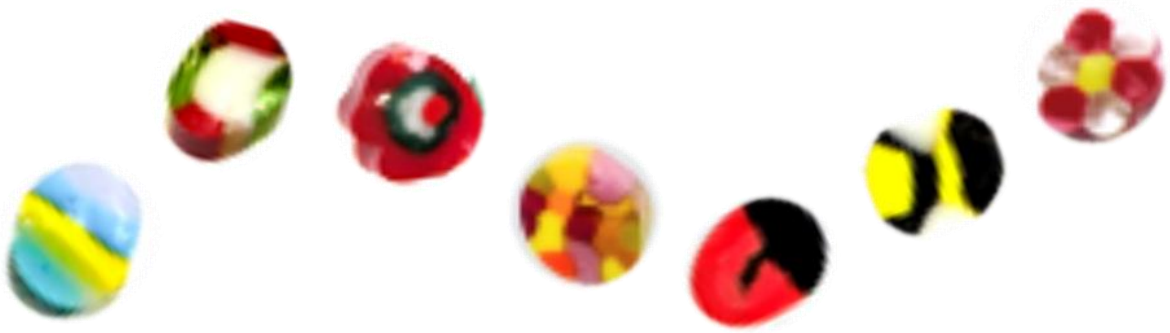
- One full fuse...
is fine for many pieces (unless specified), as long as you curve the mold and firing paper at the top to retain a circular cross section. Otherwise, the rod might end up as a D shape or oval (but still usable).

- Two tack fuses…
won't fuse together quite as solidly as a full fuse, but can keep the shape better for some designs like 1.8 Chunky Flower and 1.4 Sushi. It still needs to have the firing paper curved at the top as the top pieces can still slide down the side. It's also useful if you have other items in the kiln that need a tack fuse. It's a good way to test a small piece and if a reshape is needed, rotate the cane after on full fuse. Tack fusing creates less stress than a full fuse; glass can be re-fired more frequently with less damage.

a) 1.1 starter techniques:

- Placing coarse frit or cut rods so that they lean onto each other.
- Chopped rods piled like a tower are also easy to make for a middle stripe bee, ladybird, or a dragonfly head.

b) Cane technique on next page for designs 1.2-1.8



cane assembly

Basic cane technique:

- ruler
- marker pen
- glass mosaic cutters
- stringers, ribbons or rods from 5cm-15cm lengths
- thin clear tape
- cocktail stick, tweezers

- It might be easier to start with around 5cm to get used to handling stringers and test colours, then work up to 10 or 15cm lengths (*I found the longer stringers cut into 3 equally at 14.5cm, more economical than 15cm cuts)*.

- The simple Level 1 chunky designs are easier to handle than complex Level 2 designs.

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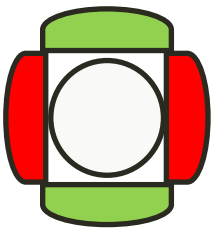
1) Place scrap paper under your work and use the project image for reference.

2) Use a ruler, marker pen and glass nippers to measure, mark out, and cut stringers or rods to length desired.

For stringers or ribbons rolled around a core:

3) Trim excess stringer/ribbon/rod so that each end is flush. Layout your glass and check that they fit over the core. Space the outer sticks 0.5-1mm apart, then tape. Method can vary slightly in each design, but the video shows each one.

4) Wrap into a cane firmly but carefully. Add plenty of tape all around the outer surface.
- Try to avoid breaking the stringers or ribbons, but they'll be okay if slightly cracked, and still in the same position. You can slice your finished work at those wonky spots after firing. If the crack is epic, you may have to cut the tape with a or push the offending stringer with a cocktail stick, but can be tricky and cause more breakage!



Any ribbons that are rounded (rather than flat) placed curved side out as above

Also see 'Tip' in Metal mold making on how to load the mold

1.1 starter technique

prep time	programme	makes
5 min.	Full fuse	Several pieces

things you need

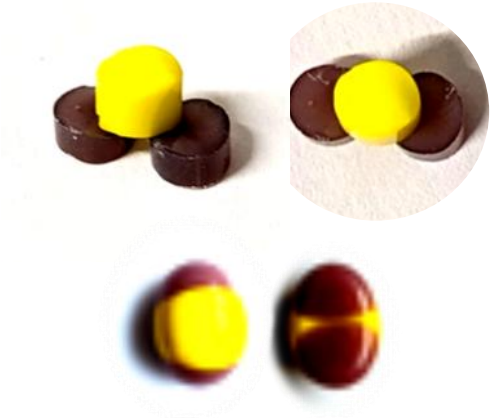
Coarse frit or 6mm rods

The Leaning method

- Place coarse frit or cut rods so that they lean onto each other. Sitting next to each other doesn't always fuse, so they have to lean, or sit on part of the other piece.

The Tower method

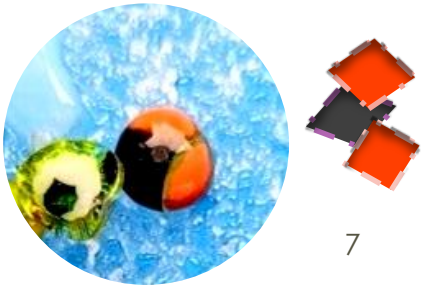
- 6mm rods cut into 2-3mm maximum thickness to ensure stability in piling them up. Choose rods that have a nice flat cut, or they will slide off each other. A 2mm thick slice will have a smaller portion of the finished product than a thicker piece, so you can adapt your designs this way.



(top and underside after full fuse)

tip

- No mold needed, so you can get started straight away!
- Great for bees, ladybirds, Easter eggs or dragonfly heads (right).
- Note the funky reaction mixing Bullseye turquoise and French vanilla in the flower pictured.



1.2 stripe design

prep time
5 min.

programme
Full fuse/
tack testing

makes
Choose
5, 10 or 14.5cm lengths

things you need

5 ribbons in chosen colours

Method

- Cut the ribbons into your chosen length

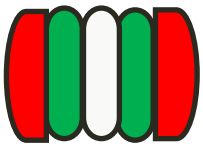
- Place the ribbons next to each other. Note that ribbons are curved one side and flat on the other, so ensure the outside pieces (red ones in drawing) have the curves facing outward.

- tape together at the ends as well as the middle as tightly as possible.

- cut lining paper approx. 28mm wide and place into metal strip mold

- position in mold as per drawing

Here, I used Bullseye turquoise, petal pink and yellow ribbons. Yellow and turquoise created an interesting reactive dark line.



tip

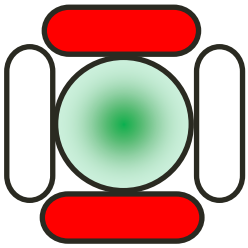
The red, green and white stripes are fun and eye catching for festive glass! Other ideas include Easter eggs, or dragonfly heads. This example uses Bullseye transparent neo-lavender, transparent turquoise, and translucent white. The finished pieces are around 5x7mm depending on ribbon sizes. They're often round out in full fused art.

1.3 chunky candy

prep time	programme	makes
5 min.	Full fuse/ tack testing	Choose 5, 10 or 14.5cm lengths

things you need

4 ribbons + 1 rod
(stringers at corners if req'd)



Method

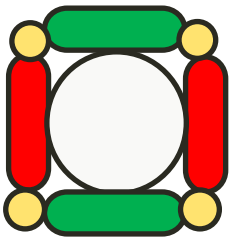
- Cut the glass onto chosen lengths

- Place the ribbons next to each other. If any ribbons are curved one side and flat on the other, ensure the outside pieces have the curves facing outward.

- tape together at the ends as well as the middle as tightly as possible.

- cut lining paper approx. 28mm wide and place into metal strip mold

- position in mold as per drawing



tip

Red and green are fun and festive! Other colours can create beautiful designs. If the corners have 1mm gaps, add 0.5-1mm stringers, as pictured above. Finished pieces are around 9-10mm diameter

1.4 sushi design

prep time	programme	makes
10 min.	Full or tack fuse	Variable lengths of scrap cane

things you need

- Scrap hollow vitrigraph cane

- A variety of 0.5, 1mm, 2mm stringers, or rods to fill inside

Method

- This is a quick fix if you have scrap hollow vitrigraph cane min. 3mm opening, for something exciting!
- Simply fill in the hollow cane with a variety of stringers as packed tightly as you can
- Tape the ends closed.
- *Cut lining paper width to cover 90% circumference and place into your metal strip mold*

Firing:

- full fuse for a plain circle cross section (like the green ones)
- tack fuse if there is an existing detailed outline,

tip

- Stringers might break inside the vitrigraph cane, but if it's a snug fit, it's fine.
- For the sunflower above, I used 2 layers of vitrigraph flakey scraps over a Bullseye cinnabar rod, and they look fine when chopped. Economical!
- A smaller cane can fit inside a larger cane, like all these poppies! I kept them on tack fuse to retain petal shapes.

1.5 random design

prep time	programme	makes
15 min.	Full fuse/ tack testing	Choose 5, 10 or 14.5cm lengths

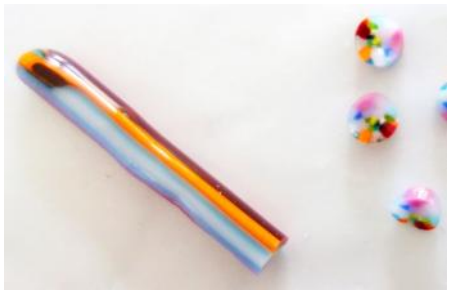
things you need

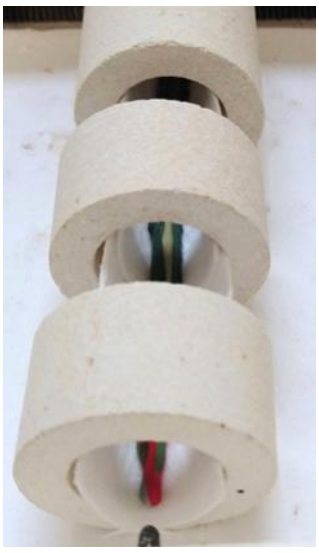
1mm and/or 2mm stringers

The festive example used approx. 21 stringers:

3 of 1mm amber
4 of red opal 1mm
3 of white 1mm
3 of white 2mm
1 of translucent white 1mm
2 of mint 1mm
5 of aventurine green 1mm

Method: any mold is fine
- A ceramic cylinder on thick kiln blanket and Bull-seye Thinfire paper results in an oval design.
- A metal mold is better, creating more of a circle cross section.
- *cut lining paper approx. 28mm wide and place into metal strip mold*





tip

This design uses a little bit of dexterity to hold all the stringers together. Try your own colours and sizes to create a fun explosion! Pictured above is my attempt of a poppy field with green grass and blue sky, with a

1.6 simple bee

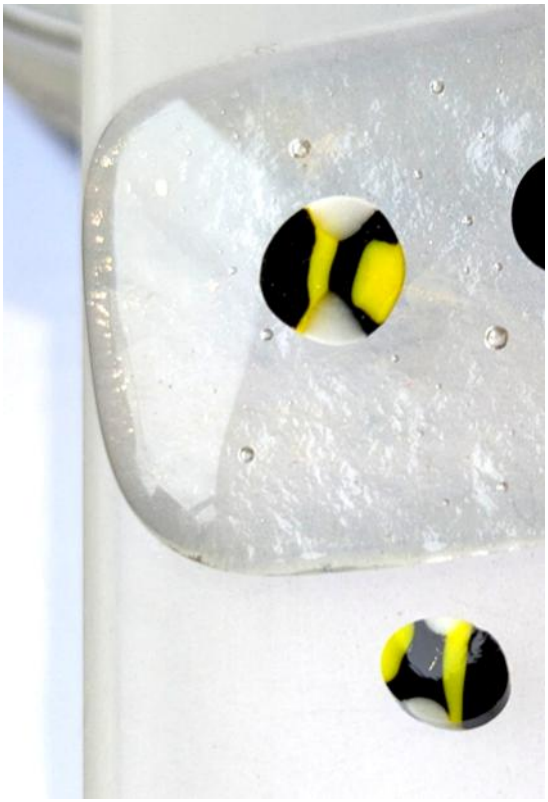
prep time	programme	makes
15 min.	Full fuse tack testing	Choose 5, 10, or 14.5cm lengths

things you need

2x white 2mm stringers*

2 black ribbons

2 yellow ribbons

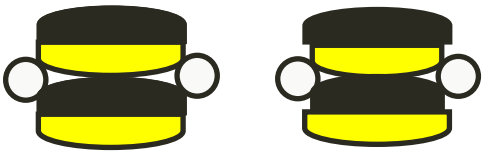


BASIC METHOD

- Assemble your ribbons, then tape a clean, flat piece of tape over the stripes as per diagram. Add the wing and check that it's a tight fit.

Tape over stripes then add wings

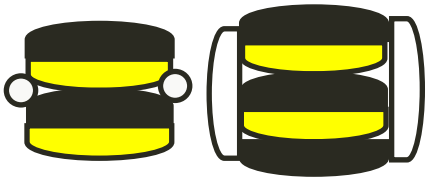
- take more clear tape and wrap around the circumference
- *cut lining paper approx. 28mm wide and place into metal strip mold*
- *position in mold as per cross-section*



1 *2*

tip

* Alternatively, 2x white 1mm stringers or ribbons (pics 3, 4)
- Your ribbons might be curved on one side and the white wings can fit in snugly there (pic 1).
- If you have two narrow ribbons, they may fit the white wing better in the middle (pic 2)
- Thin ribbons may fit an extra black (right)
- Finished pieces are around 8mm x 6mm and may become round when placed on top of full fused art.



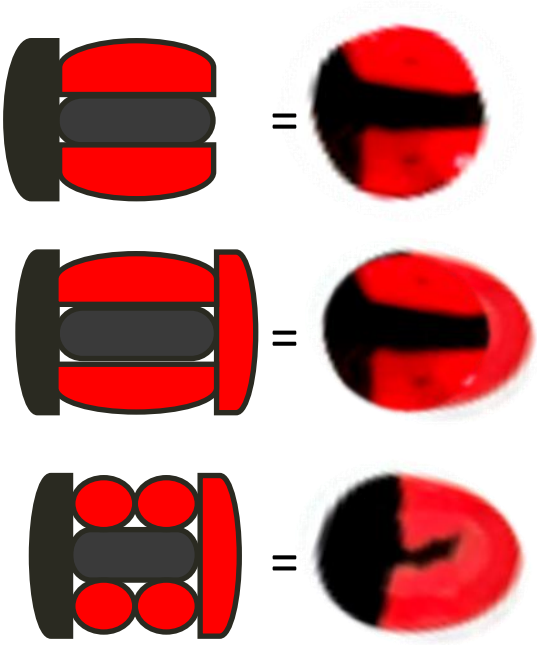
3 *4*

1.7 simple ladybird

prep time	programme	makes
15 min.	Full fuse/ tack testing	Choose 5, 10 or 14.5cm lengths

things you need

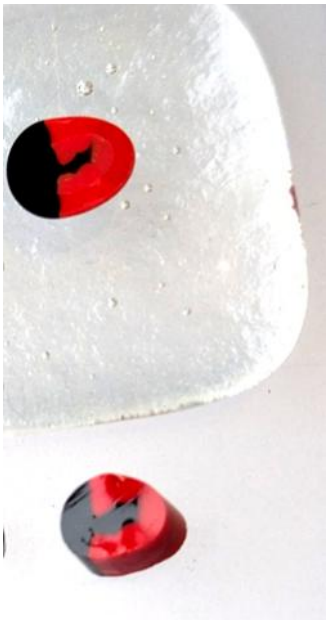
4 of the 2mm red stringers (or 2 ribbons instead)
2 black ribbons
1 red ribbon



You can decide what your own stock of ribbons and stringers fit together with these two design choices

BASIC METHOD

- Lay out your ribbons and stringers as per diagram, then tape to both sides at each end. Check that it's a tight fit
- Take more clear tape and wrap all stringers around the rod
- *Cut lining paper to cover the circumference and place into metal strip mold.*
- *position in mold on its side, as per drawings*



Tip

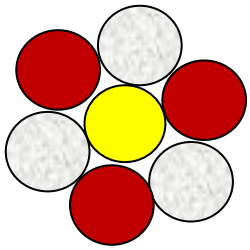
- Your ribbon might be curved on one side, which is handy for the head and rear end, as seen in the diagram.
- Finished pieces are around 8mm long and 6mm wide.
- Why are there no dots? That's more complex and featured in my Level 2 course.

1.8 chunky flowers

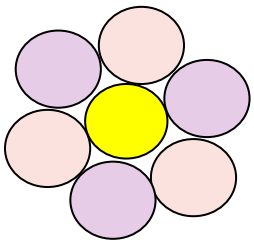
prep time	programme	makes
15 min.	Full or tack fuse	Choose 5, 10 or 14.5cm lengths

things you need

2mm stringers: *
3 red opal
1 yellow opal
3 clear or other colour



BASIC METHOD
-lay out your stringers with a 0.5mm gap between them, then tape to both sides at each end. Check that it's a tight fit that covers the yellow middle and swap stringers if required for a better fit
- take more clear tape and wrap all stringers around the rod
- cut lining paper approx. 17mm wide and place into your mold



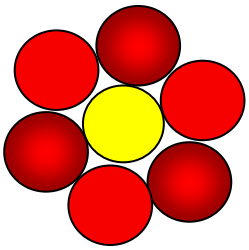
Example of petal pink and neo-lavender

Kiln programme options:

- One tack fuse (CoE 90)
  if you want to keep the rounded petal shapes

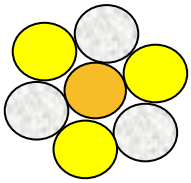
- 2nd tack fuse
  is used for a more solid design

- Full fuse
  example with transparent red instead of clear petals



tip

* For CoE 96, try a 4-5mm Reichenbach rod (see resources) or vitrigraph cane core. Alternativelty, all 1mm stringers for tiny flowers; pack the mold thick to retain roundness (see pic 6b on mold making page).
- 2 differing colours for the petals makes them stand out better.
- The finished pieces are around 6mm wide
- These might make great daffodils, with clear and yellow ...



1.9a gallery and resources

Suppliers: UK and elsewhere

Bullseye Thinfire paper:
pearsons-glass.co.uk, warm-glass.co.uk, glassstudiosup-plies.co.uk, creativeclay.co.uk, metalclay.co.uk
Papyrus paper: (new organic version best)
pearsons-glass.co.uk, creativeglassguild.co.uk, creativeglass-hop.co.uk,
Ceramic fibre blanket/paper from 1mm to 3mm:
warm-glass.co.uk, creativeglassshop.co.uk, glassstudiosup-plies.co.uk

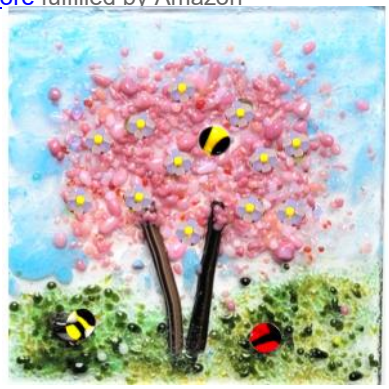
CoE 90 glass:
pearsons-glass.co.uk, warm-glass.co.uk, creativeglasss-hop.co.uk, glassstudiosupplies.co.uk
CoE 96 glass:
creativeglassguild.co.uk, pearsons-glass.co.uk, gamesofcol-ors.com
For 4-5mm Reichenbach rods: tuffnellglass.com, chockadoo.com.au, berlinbeads.de, glasscolor.com (bulk buy), juneglass.eu, GlassDiversionsFrit (Etsy) / glassdiver-sions.com sells Raku Cane Rods

Scrap vitrigraph cane:
Various shops in Etsy and eBay, as well as tabithasglassempori-um.com

Kitchen scissors:
Several good brands, including Kitchen Devils and ProCook

Clear tape 12mm wide for Level 1 designs,
(10mm Level 2 designs):
Cellophane based tape such as Sellotape or Scotch Tape from various stationery suppliers

Stainless steel cookie cutters:
Make sure they clearly state stainless steel and are unpainted. If they bend easiliy between two fingers, they are workable as a mold.
Mine are from cheap shops and Amazon:
12 Pcs Cookie Cutter Set, Mini Stainless Steel Geometric Cookie Cutters Shapes Heart Star Circle/Round Flower Mould for Biscuit Pastry Baking Fondant Sandwich Cake Decorating Kids Clay Christmas Sold by: Booster store fulfilled by Amazon



1.9b troubleshooting

Common issues

Bear in mind your own kiln's temperature to see how your first pieces turn out, and here are a few more tips…

1) Restarting the tape stage

If you are unhappy with assembly the first time round, use a craft knife or fine scissor blade and gently slice along the length of the outside edge in at least 2 places. If you have very fine stringers and splicing tape might crack them, perhaps try soaking in water to loosen the tape adhesive.

2) Stringers break at assembly stage:

- Commonly done, but usually not obvious if you cut the completed cane at the flawed spots.

3) Fixing at taping stage:

- Fallen pieces can be pushed back in with a cocktail stick or tweezers.
- If there will be an obvious gap in the cane, cut the tape, remove the broken stringer with a cocktail stick, and replace it, but may risk further breakage.

4) Stringers or ribbons slid down the sides of the cane's core:

- First and foremost, a tighter mold will help that covers more around the top.
- You could remedy this by adding more to the top of the bald areas and fire again
- Try two tack fuses next time.

5) Cane length drooped in places after firing:

- It depends on how droopy it is, but will slice okay if you cut in the places that won't show.

Best practice:

- move the metal mold pieces closer together
- place fibre blanket pieces under unsupported areas
- use 1-3mm thick fibre blanket to support the length

6) Oval shaped cane

- This can look fine and can even round out if placed on the top surface over full fused art.
- could place in the kiln again vertically so that it flattens a little
- Next time gently ease the mold closer and tighter into a circular shape.

Notes

Keep a log of your accomplishments with colours, firings and outcomes.

Flat-bed kiln murrine level 1 + video

Discover how to create your own unique fused glass murrine using a flat-bed kiln. This Level 1 course is designed for beginners and focuses on simple, effective techniques. Creating your own murrine is not only fun and creative, it's also practical. Making your own designs can be quicker and more cost-effective than buying pre-made murrine, and allows you to create bespoke patterns that perfectly match your existing work. Best of all, you can do it with the kiln you already have—no need to invest in new equipment.

Do I Need Any Special Tools or Skills?
No prior experience is needed. You'll only need standard glass fusing tools and a few basic kitchen items. CoE 90 glass has more range of materials, but other CoE glass can work beautifully for the designs.

Included in the 20-page document and 30 minute video:

- Level 1 introduction
- Tools and materials overview
- Core techniques

1.1 starter technique
1.2 stripes
1.3 chunky candy
1.4 sushi
1.5 random design
1.6 simple bee
1.7 Simple ladybird
1.8 chunky flowers
1.9a gallery + resources
1.9b troubleshooting