

# SAND CASTING WITH HEALING PHOENIX LAPIDARY FIRE IN PLACE CULTURED OPALS



*Sterling Silver Cultured Opal Rings by  
Nadine Citerne*

*(Right to left)  
Bermuda Ocean Opal, 5 mm  
Pink Blush, 3 mm  
Cool Mint, 4 x 6 mm*

Sand casting is an ancient jewelry-making technique that involves using jeweler's sand as the molding material; Delft clay, and even beach sand are used to create a mold. Sand casting allows jewelers to create castings in their own studio cost-effectively versus sending your master model to a casting house. Each piece is unique since the jeweler can only use the molds once.

Sand Casting stones are known to be tricky, and nothing is guaranteed as stones can crack or move out of place, so I went to Nadine Citerne of Nadine Suzanne Jewellery, who is the mad scientist who conducted proof testing for the Cultured Fire in Place Opals in the Sand Casting process. She creates one-of-a-kind sand cast jewelry inspired by the ocean and often has cast stones in place, making her the perfect person for testing. Nadine incorporates unique elements like beach sand, resulting in beautiful textures and organic details you will see in the successful pieces.



*The Jeweler's Wax used to Carve the Ring  
Design*



*Sand Casting Flask*

## SAND CASTING PROCESS

### 1. Models Used for Casting

Common designs used can be cast rings, pendants, and bezel rings. Signet rings are also widely made using this method. A master, usually made of wood, plastic, or metal, is created. Jeweler's wax is the typical master used as a mold alongside found objects such as shells, buttons, etc.

Nadine usually starts by carving a design in wax. The wax models are carved to allow 0.5mm space for the metal to flow behind the stone and wrap around it, securing it in place.

The wax model is then placed in a container called a flask, which is packed tightly with the jeweler's sand to capture all the details of the master. Ring-making wax is hard, easy to carve, and does not break easily when pressed into the sand.

### 2. Sand Used for Testing

Nadine uses two common types of sand available on the market.

- Red Clay is sand manufactured and sold by DIY Castings.
- Delft Clay is commonly found in most jewelry supply stores.

### 3. Sand Casting Flask

A flask is an open container that holds the sand and supports the mold during the casting process. It has no top or bottom, just sides. The flask consists of two parts, called male and female. The male side has a protruding lip and vent holes.

### 4. Filling the Male Side of the Flask with Sand

Sand is packed into the male side of the flask from behind using a hammer, and the top is leveled off.



*Sand packed into the Male Side of the Flask*

### 5. Adding the Wax Model

The wax is pressed halfway into the sand, and baby powder is brushed over this half of the mold so that the two sides do not stick together.

### 6. Filling the Female Side of the Flask with Sand

The female side of the flask is placed on the male side, and the sand is packed in from behind and leveled off.

### 7. Removing the Wax

The flask is then separated, removing the female from the male straight off without twisting. The wax model is carefully removed, leaving a cavity for the metal to flow into.



*Add the Sprue and Vents*



*Wax Model is Pressed Halfway into the Sand and Baby Powder is Brushed Over the Top*

### 8. Sprue and Vents

Sprue and funnel are created to allow the metal to be poured into the mold. The sprue and funnel connect to the cavity created by the wax mold. This is where the molten metal will be poured into. The funnel is designed to pool any excess metal.

Vent holes are also added. These help the gas escape. When the metal is poured in, the gas needs to escape. These vent holes help the gas escape and also act as a vacuum, drawing the metal down.



*Pouring Molten Metal*



*Add the Female and Fill the Flask with Sand*

### 9. Pouring Molten Metal

All of the rings tested were cast using a Smith Little Torch with a rosebud tip. After the mold is assembled, molten metal is poured into the gate, filling the cavity. The metal then cools and solidifies in the shape of the design, which forms the cavity.

*Note: The other common type of torches used are MAPP gas bottles – these are handheld torches, but they don't melt the silver as quickly as the Smith torch.*

- Top Pour  
Pouring metal from the top of the flask. This method is commonly used for pendants and flat objects.
- Side Pour  
Pouring from the side of the flask, typically used for rings.



*Top Pour and Side Pour Flasks*

### 10. Removing the Casting

The metal is allowed to cool and solidify. Once the item is cast, the mold is opened right away, and the raw cast is removed and left to cool down. If the item does not have stones cast in place, it can be cooled right away in water; however, due to thermal shock to the stones, the items were left to cool on their own.



*Remove the Wax Mold*



*Remove the Cooled Metal Casting*



*Opal in the Mold with  
PawPaw Ointment*



*Pink Blush Cultured Opal  
Cast in Sterling Silver*

## CASTING HEALING PHOENIX LAPIDARY CULTURED OPALS IN PLACE

After creating the mold, the Opals are cleaned and placed inside the cavity. The Cultured Opals have a thin layer of pawpaw ointment (petroleum jelly) on the table of the stone to help prevent them from moving around in the mold. However, beware, when sand casting any stones in place, you are never guaranteed placement or whether the stone will survive. The ‘cast in place’ look gives a rough and organic feel to a piece.

- Casting Stone Placement  
All Cultured Opals have a thin layer of pawpaw ointment applied to their tables to prevent them from moving around in the mold. After casting, no rings were placed in water; they were left to cool naturally to avoid thermal shock.
- Stones that were used in Casting  
Faceted and cabochon Cultured Opals were tested. Faceted Opals size 3 - 6 mm were successful. A few cabochons did not survive; however, the 4 x 6 mm Cool Mint Cultured Opal Cabochon was shallow and survived, possibly for that reason. They are not commonly used in the sand casting or lost wax method as cabochons are more susceptible to thermal shock during casting in metal because they are not good conductors of heat and can suffer shock during rapid heat or cooling.

### Finishing and Polishing

The piece is ground to remove excess metal, cleaned, finished, and polished to achieve the desired texture and appearance. Please refer to the “Working with Fire in Place Cultured Opals” section, which looks at tumbling, patinas, and rotary tools, as well as protecting the Cultured Opal during those processes.

## METHODS OF SAND CASTING AND CONCLUSIONS

### Bermuda Ocean Round Faceted Cultured Opal (6mm)

- Metal: Sterling Silver
- Method of Casting: Core Casting/Vacuum Table
- Mold Heated: No
- Damage to Opal: None
- Color Change: None

Conclusion: Would I cast with this Cultured Opal? **Yes**

*Notes: After removing the ring from the flask, the opal appeared dull. Cleaning restored its initial beauty and sparkle.*

### Pink Blush Round Faceted Cultured Opal (3mm)

- Metal: Sterling Silver
- Method of Casting: Standard Flask – Side Pour
- Mold Heated: No
- Damage to Opal: None
- Color Change: None

Conclusion: Would I cast with this Cultured Opal? **Yes**

### Black Fire Round Faceted Cultured Opal (5mm)

- Metal: Sterling Silver
- Method of Casting: Core Casting/Vacuum Table
- Mold Heated: Yes
- Damage to Opal: Yes
- Color Change: None

Conclusion: Would I cast with this Cultured Opal? **Yes**, because the color is amazing. I’d like to try again without heating the mold.

*Notes: The opal looked good after removing the ring from the mold with no visible cracks. However, using a graver during cleanup to expose the stone more caused it to crack, possibly due to the opal's fragility from the casting process and my actions.*

## RECOMMENDATIONS FOR SUCCESS

As mentioned earlier, there are no absolute guarantees with sand casting, but there is great proof that success is not only possible with Cultured Opals, but achievable even when others who work in the field of sand casting were in doubt.

- Cabochons are more challenging to sand cast in place than faceted stones because they have a smooth, curved surface, making it difficult to secure them properly in the mold. Faceted stones, with their multiple flat surfaces, can be more easily positioned and held in place. In addition, cabochons are more sensitive to high temperatures involved in sand casting, leading to a greater chance of thermal shock resulting in cracking. This is because they are not good conductors of heat and can suffer shock during rapid heat or cooling.
- This may be because the dome shape may not be as stable as your typical faceted stone.
- The best sizes to work with are 2 – 5 mm, but again, a 6 mm worked with no problem.
- Be careful with your tools, including the popular graver, when removing metal around the stone. Use a protective barrier, such as several layers of masking tape placed over the stone. This helps prevent accidental scratches or chips.
- Not all cultured or lab-grown opals have the same properties nor are they all heat resistant. Read their descriptions carefully, as they should have no polymers or resin in them.

## EDUCATIONAL RESOURCES:

### Where to Buy Healing Phoenix Lapidary Fire in Place Cultured Opals

- Gage Designs: [www.HollyGage.com](http://www.HollyGage.com)
- Healing Phoenix Lapidary: [www.HealingPhoenixLapidary.com](http://www.HealingPhoenixLapidary.com)

### Metal Clay and Sand Casting with Fire in Place Cultured Opals

- Metal Clay and Sand Casting and Fire in Place Cultured Opal Education: [www.HollyGage.com](http://www.HollyGage.com)
- Metal Clay and Sand Casting and Fire in Place Cultured Opal Education: [www.HealingPhoenixLapidary.com](http://www.HealingPhoenixLapidary.com)

### Sand Casting with Fire in Place Cultured Opals

- Sand Casting information videos and education: [www.NadineSuzanneJewellery.com](http://www.NadineSuzanneJewellery.com) and [www.instagram.com/nadinesuzannejewellery/](http://www.instagram.com/nadinesuzannejewellery/)
- Fire in Place Cultured Opal Education: [www.HealingPhoenixLapidary.com](http://www.HealingPhoenixLapidary.com)
- Casting Supplies and Red Clay: [www.diycastings.com](http://www.diycastings.com)

Holly Gage of Gage Designs, is a celebrated jewelry designer. She has been honored with the Saul Bell Design Award for her distinction in jewelry design and the AMCAW Innovation Grant Award for her groundbreaking work in developing firing techniques for Fire in Place Cultured Opals in jewelry. Holly is a pioneer in the Metal Clay community, specializing in creating contemporary jewelry and sharing her unique techniques through a blend of design instruction and technical proficiency. She is dedicated to fostering innovation, creativity, and helping others find their artistic voice through her classes, mentoring programs, master workshops, and retreats, which are available live online, at her studio in PA, in the US, and internationally. Holly holds a BS in Fine Art and Education and is a full-time jewelry artist, Certified Metal Clay Instructor, author, and conference speaker. Her jewelry and articles on techniques and design have been featured in over 80 regional and national publications, including the Best of America Jewelry Artists, Handmade Business: Named 3rd in Top Makers, Movers, and Shakers, and Metal Clay Today. For more information about Holly's jewelry, classes, awards, as well as Metal Clay tips, tutorials, and blogs, you can visit her website at <http://www.HollyGage.com>.

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