

# Silver Soldering on Metal Clay

Metal Clay World Conference

Deborah E. Love Jemmott

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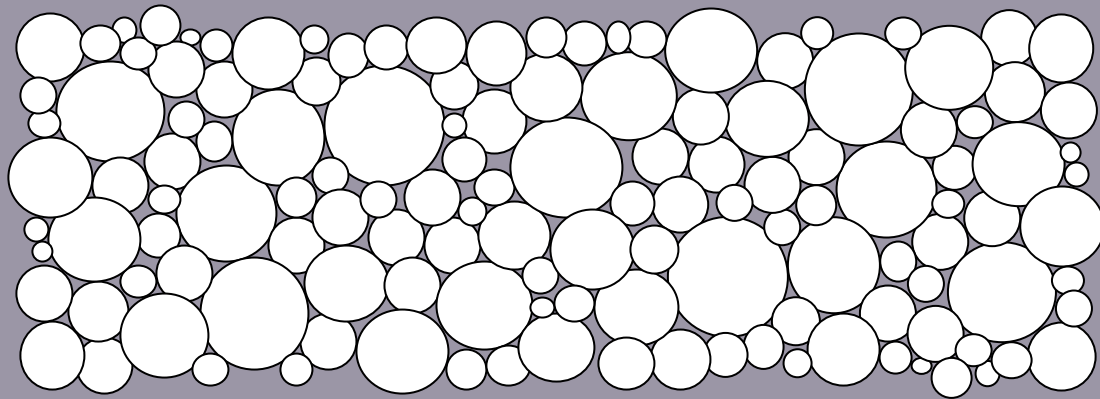
# Soldering on Metal Clay

- Burnish the Metal Clay Surface

# What is Burnishing?

Burnishing is the process of rubbing the metal with a small hard tool to compact the surface. For porous surfaces such as metal clay, it helps fill the microscopic voids in the surface by making the small pieces of metal fit more tightly together.

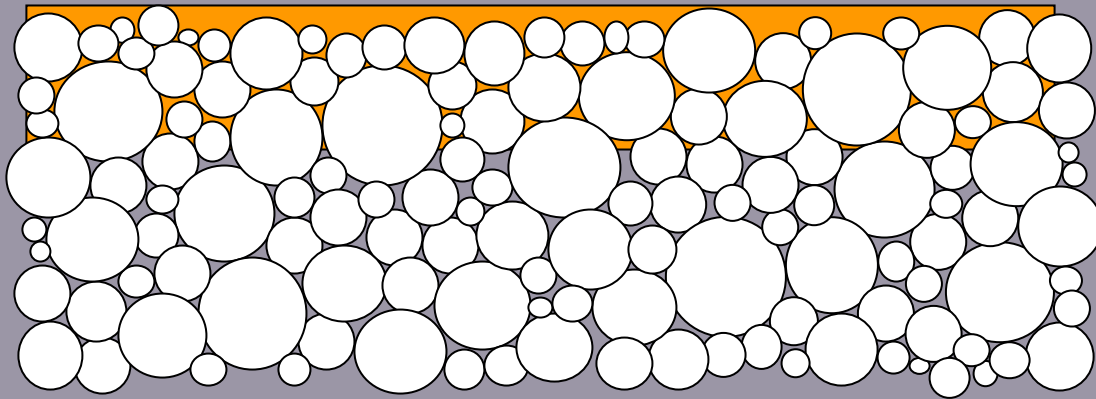
# Metal Clay Fired and Sintered



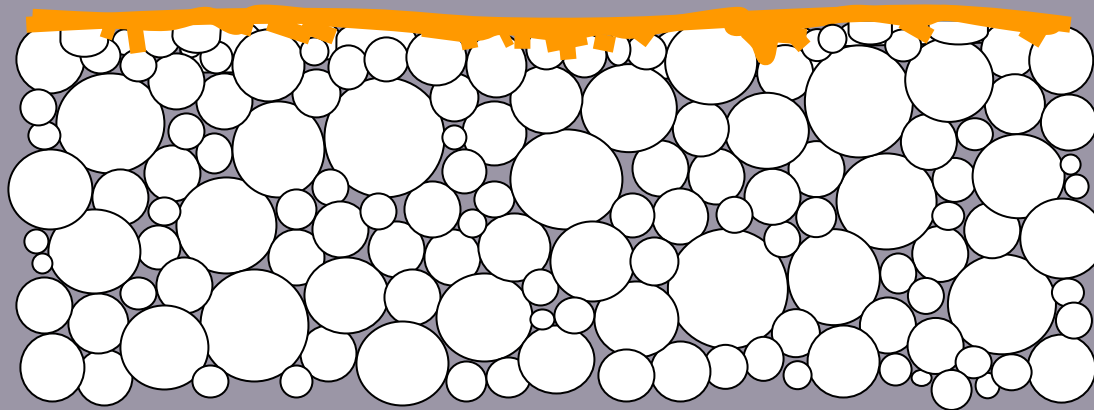
# What is Sintering?

Sintering is the bonding of adjacent surfaces of small particles by heating the material at a high temperature, but below that of the melting temperature of any constituents in the material.

# Solder Penetrates a Non-Burnished Surface



# Solder on a Burnished Surface



# Why does this Matter?

- The voids suck the solder in like a sponge

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- The voids suck the solder in like a sponge
- The solder can create a large discolored area and can go completely through thin pieces
- If too much solder is absorbed into the metal clay, there will be insufficient solder to join the pieces of metal being soldered

# How do I Burnish?

- Rub the fired metal clay in multiple directions while pushing hard with an agate or metal burnisher

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- Rub the metal clay in multiple directions while pushing hard with an agate or metal burnisher
- Tumble the fired metal clay piece in rotary tumbler with steel shot

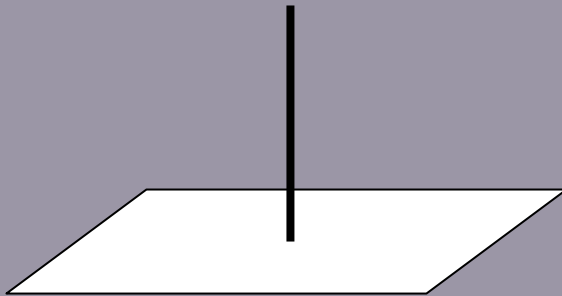
# How do I know if it's Burnished Enough?

The piece should be shiny with no white, frosty areas where the solder will be flowed. The white, frosty looking areas are where the sintered metal has not been fully pushed together and will more easily allow solder to flow into the voids.

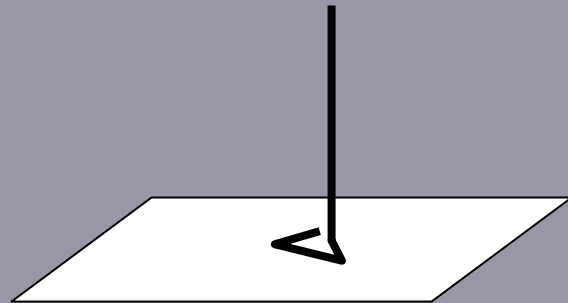
# Soldering on Metal Clay

- Burnish the Metal Clay Surface
- Maximize the Contact Area

# Soldering on Metal Clay

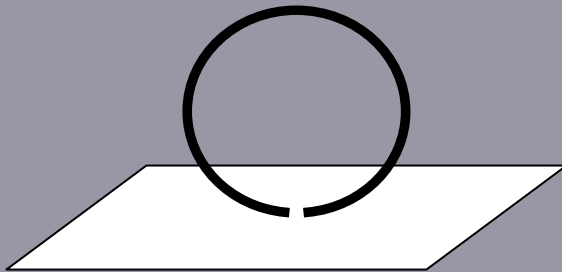


Insufficient Contact

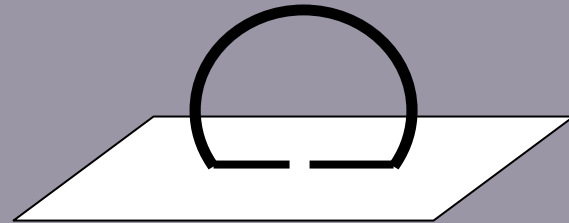


Good Contact

# Soldering on Metal Clay

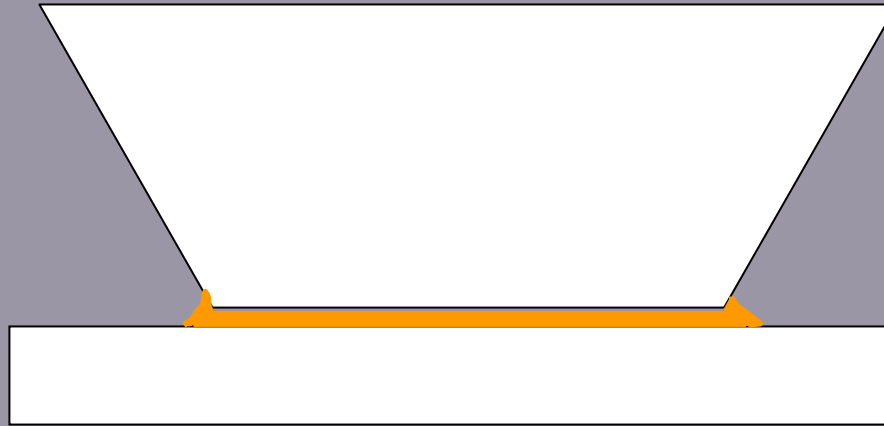


Insufficient Contact



Good Contact

# Why Does This Matter?



An ideal solder joint has a small fillet where the two pieces of metal connect.

# Why Does This Matter?

If the solder sucks into the metal clay voids rather than primarily staying on the surface to join with the other metal, the joint will be much weaker.

What Can I do About It?

**BURNISH**

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**BURNISH**

What Can I do About It?

BURNISH

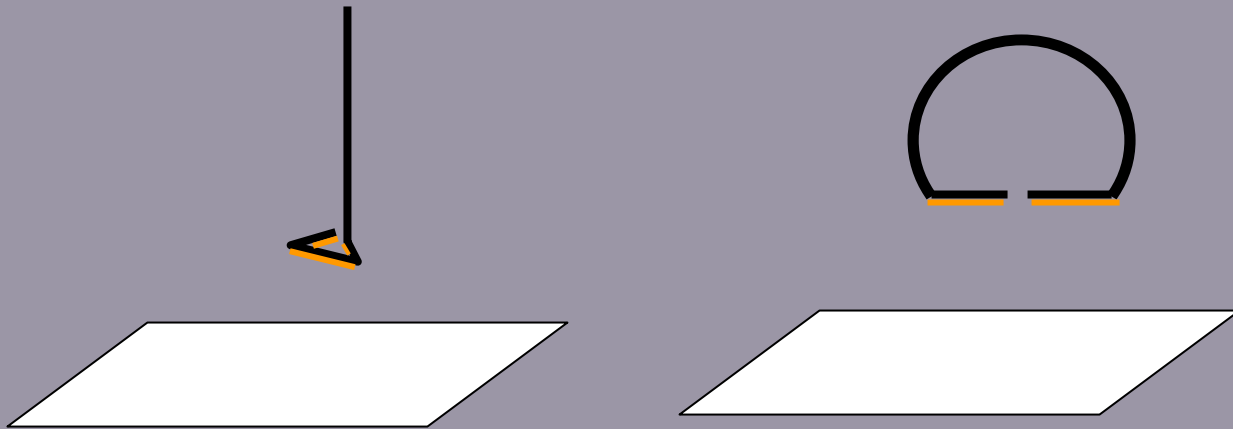
BURNISH

BURNISH

## Soldering on Metal Clay

- Burnish the Metal Clay Surface
- Maximize the Contact Area
- Flow the Solder onto the Milled Metal First

# Soldering on Metal Clay



Flow Solder on the Milled Metal First

## Why Does This Matter?

The milled metal will not absorb the solder the way the metal clay will. The longer the metal clay is heated during the solder process, the more opportunity there is for solder to flow into the clay. Flowing the solder on the milled metal first will allow for minimal heating of the metal clay thus making the solder not as likely to penetrate the surface of the metal clay.

## Soldering on Metal Clay

- Burnish the Metal Clay Surface
- Maximize the Contact Area
- Flow the Solder onto the Milled Metal First
- Be Generous with the Solder

# Why Does This Matter?

Even though the metal clay is burnished and the contact area is maximized, there will be more solder absorbed by the metal clay than is typical for milled metal. If a generous amount of solder is provided, there will be enough to form a solid solder joint even though some will be lost to the metal clay structure.

The following pieces all contain Art Clay<sup>®</sup> or PMC<sup>®</sup> used in combination with traditional fabrication techniques.



## Labradorite Neckpiece

Fine Silver / Sterling Silver / Labradorite / Tourmaline

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## Tie It On Pendant

Copper / Fine  
Silver / Sterling  
Silver / Agate

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Jemmott  
©2003



## Athena Earrings

Fine Silver / Sterling  
Silver / Chalcedony  
/ Moonstone

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## Athena Neckpiece

Fine Silver / Sterling  
Silver / Chalcedony  
Beads / Pearls / Glass

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©2004



## Copper & Jasper Brooch

Fine Silver / Sterling  
Silver / Copper /  
Jasper / Iolite

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Copper / Silver  
Pendant

Copper / Fine Silver /  
Sterling Silver / Amethyst

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## Dinosaur Brooch

Copper / Fine Silver / Sterling Silver / Petrified Dinosaur Bone / Onyx

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Crystal  
Neckpiece  
Fine Silver /  
Sterling Silver /  
Quartz Crystal /  
Pearls / Hematite  
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