

Inlay Techniques

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Fill voids and cracks



Decoration



Turquoise & brass in epoxy



Copper in epoxy

Color accents
(tinted epoxy)



Designs
(Inlaid turquoise)



Common resin systems used by turners

Inlace (unsaturated polyester)

CA glue (cyanoacrylate)

System Three (two part epoxy)

Resin System Properties

How they work

Advantages

Limitations

Safety

Inlaying with Metal Powders

[Brass](#)

Copper

Stainless steel

Color

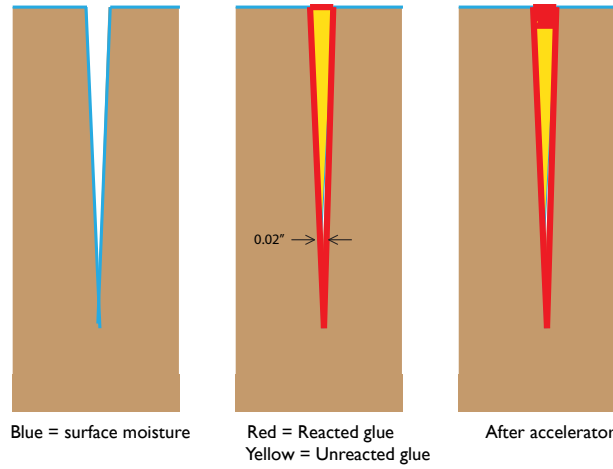
Inlace (unsaturated polyester)

- Advantages
 - Simplicity
 - Kits contain everything you need
 - Looks good
- Limitations
 - Cost
 - Cannot mix small amounts (limit is about 1/2 oz)
 - Weak bonding
 - Can't be used to stabilize cracks
 - May not bond to oily woods like cocobolo
 - Wood must be dry (6% moisture or lower)
 - Grooves need to be undercut
 - Cures slowly
 - Can be difficult to keep in place during curing
 - Thickener helps keep in place but may result in holes
- Safety
 - Catalyst is volatile, flammable and toxic.
 - Use in well ventilated space and/or use respirator

CA Glue (cyanoacrylates)

- Advantages
 - Cost
 - Speed
 - Simplicity (one component system)
 - Strong bonding (will stabilize **thin** cracks)
 - Versatility
 - Compatible with a wide variety of materials
 - Works with wet wood
- Limitations
 - Appearance (clear and can't be tinted)
 - Not gap filling
- Safety
 - Accidental glueing (acetone will soften set glue)
 - Reacts violently with some materials resulting in heat and irritating and slightly toxic fumes
 - Cotton
 - Coffee grounds
 - Some wood dusts

How CA Glue Works



System Three (epoxy resin)

- Advantages

- Cost

- Can be mixed in small quantities minimizing waste

- Strong bonding

- Will stabilize cracks
 - Grooves do not need to be undercut

- Versatility

- Compatible with a wide variety of materials
 - Works with wet wood
 - Can be tinted
 - Can be either fast or slow curing

- Limitations

- Can be prone to bubbles

- Safety

- Avoid eye and skin contact

Materials compatible with epoxy resins

Materials I've Used

Crushed Stone
Turquoise
Pipestone
Inlace granules
Powdered metals
Brass
Copper
Stainless steel
Red coral
Coffee grounds

Materials that should work

Crushed Stone
Lapis lazuli
Powdered metals
Bronze
Ground nut shells
Pecan shells
Ground Sea Shells
Abalone shell
Oyster shell

Considerations

- Color
How will it contrast with the wood
- Shape and particle size
Will the particles pack tight or have gaps
Will tinting be needed
- Hardness
Will it cut with lathe tools

Mohs Hardness Scale

Diamond	10	
Corundum	9	
Topaz	8	
Quartz	7	
-----	-----	-----
Feldspar	6	Turquoise (5 - 6)
Apatite	5	Lapis Lazuli (5 - 5.5)
Fluorite	4	
Calcite	3	
-----	-----	-----
Gypsum	2	Pipestone (2.5)
Talc	1	

Inlaying metal powders with epoxy

- Goals:

- Shines like metal

- Looks like a solid piece of metal

- Potential Problems:

- Voids

- Bubbles

- Uneven color

- Staining

Variables (things you control)

- Metal to resin ratio
- Total amount mixed
- Order of addition of components
- Mixing the components
- Application of the mixture
 - surface preparation
 - single or multiple applications
 - heat
 - smoothing
- Sanding (finest grit used)

Metal to Resin Ratio

Increasing the metal to resin ratio

- Positive affects:

- Improves shine

- Thickens the mixture increasing control

- Negative affects:

- Increases possibility of voids

- Increases possibility of holes

- Brass: Maximum is 3:1 metal powder to resin

- 0.1 oz Epoxy Part A

- 0.1 oz Epoxy Part B

- 0.6 oz Brass powder

Making the mixture

- Determine the needed metal to resin ratio
 - Use 3:1 when possible
 - Use 2.5 : 1 for thin cracks and small voids
- Determine the total amount of each component
 - Larger volumes mean longer mixing times
 - Longer mixing times mean less working time
 - Practical limit is ~0.2 oz of resin (Part A + Part B)
- Mixing order
 - Epoxy Part A, Brass, Epoxy Part B
- Mixing
 - Mix gently
 - Fold mixture rather than stir
 - Get all the powder wetted

Application

Surface Decoration Stabilization

Horizontal
(Grooves & Voids)

Vertical
(Grooves)

Horizontal & Vertical
(Cracks & small voids)

metal:resin:
applications:
dam:
heat:

3:1
single or multiple
optional
yes

3:1
multiple
no
no

2.5:1
single
yes
yes

Costs

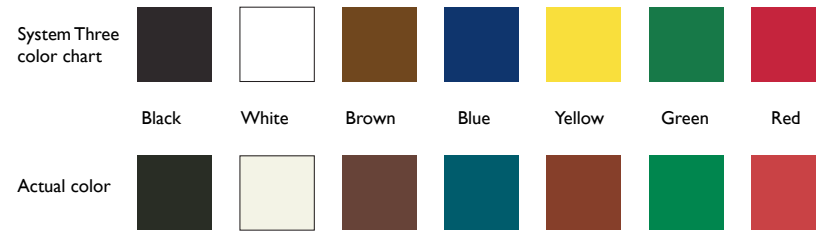
Scale \$32.99 (Amazon)
System Three resin (4 oz) \$22.99 (Woodcraft)
Brass powder (16 oz) \$13.55 (Ozo Metal)
\$33.80 (Craft Supplies)
Pill cups (250) \$ 3.49 (Med-Tech)
Med cups (100) \$ 2.89 (Med-Tech)
Tongue depressors (500)\$11.95 (Med Tech)



1 Digital POST OFFICE OUNCE
SCALE-Tabletop/Desktop Oz
Postage/Stamp/Postal Shipping
Weight Balance + 5 Gram Gold Test
Bar
by DigWeigh

Tinting System Three Epoxy

System Three pigments come in seven colors



Colors can all be mixed

Except for yellow a 2 oz jar costs about \$12

Pigments are very concentrated so a 2 oz jar is a lifetime supply