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# Basic E-Coating Principles

## Surface Preparation

- Begin by making sure your work area is clean and free from excess airborne dust; this will help ensure a clean workpiece throughout the coating process.
- Make sure your workpiece is free from oils, grease, dirt, polishing compounds and fingerprints. Once you begin the process, do not touch the workpiece with your hands until the piece is completely cured.
- Have plenty of deionized or distilled water available.
- Make sure you have a separate rinse container for the electrocleaner, the acid dip and the solution (the solution benefits by having two rinse beakers to us, one right after the other). Rinsing is very important after each step; refresh the rinse water often to prevent cross-contamination.

## The Water-Break Test

Use the water-break test to check for cleanliness. After electrocleaning the workpiece, dip the piece into the rinse water then slowly remove it; as you remove the piece from the water, it should be uniformly wet and the water should run off evenly. If the water beads up in some areas, this indicates the presence of oils or contaminants that still need to be removed.

## The Solution

- Each nano-ceramic solution, except the clear, can give you various shades of the selected color. The shade achieved is directly related to the voltage level and time in the solution. For instance, if you purchased the blue nano-ceramic solution and use it at a low voltage for a short duration, you may achieve a light-blue or sky-blue color. Using this same solution at a higher voltage and for a longer duration, you may achieve a richer, darker blue.
- The thickness of the coating is also determined by voltage level and time in the solution. The higher the voltage and the longer the duration in solution, the thicker the coating.
- Filtering the solution before pouring it into the beaker for coating is highly recommended in order to remove the hard particles that can form in the solution over a period of time.
- A magnetic plate with agitation or stirring action will help keep the nano-ceramic solution from depositing any larger particles on the piece; it also helps to properly coat detailed and recessed areas.
- Keep solutions at around room temperature, 68°–86°F (20°–30°C). Never heat the nano-ceramic solution.

## A Note About Cast and Metal Clay Pieces

- The micro-porosity of a cast workpiece may not be visible but, when a cast piece is coated, the porosity may hold water, which will want to escape during the curing process, causing bubbles, blisters or small dots on the surface of your piece. To avoid this problem, make sure your piece is completely dry after cleaning.
- Metal clay workpieces can behave similarly to cast pieces. In fact, they typically feature even more porosity. You may need to extend the drying time after cleaning to ensure that the piece is completely dry before coating.

## Fixturing Workpieces

- The smaller the contact point between the handling wire and the workpiece, the less base material will be left exposed after coating.
- Avoid attaching too many pieces to the same handling wire. Once pieces have been coated, they are very tacky until they dry and can stick to one another.
- Chains may require two contact points.

## Masking

- In order to allow specific parts of the workpiece to be coated with one color while the rest remains uncoated or to be coated with another color, you must mask the piece.
- If you want a two-tone piece, the first color must go through the entire process and be cured before applying the second color. The contact points to the handling wire should remain the same; you may need to remove a small amount of coating in order to maintain good contact with the base metal.
- Ear posts can be masked with post protectors or sleeves.
- Clean the work surface with electrocleaner and acid dip before the masking material is applied.

## Safety

- The e-coating process involves certain chemicals that are dangerous if ingested, inhaled or absorbed. Precautions should be taken during the e-coating process.
- Wear protective gloves, eyewear and a respirator.
- Do not eat or drink in the work area to avoid accidental ingestion.
- Always work in a well-ventilated area. Fumes from the solutions and the oven curing can be harmful.
- Store chemicals in appropriate containers.
- Follow proper disposal procedures for chemicals and coatings.
- Practice common sense when using the rectifier; it is an electrical device and can be harmful if used incorrectly.

## Problem-Solving Tips

### Bubbles

- A. Small spots or bubbles can indicate that your piece was not completely dry before going into the nano-ceramic solution. Make sure your piece is completely dry after cleaning.
- B. Cast or metal clay pieces that tend to hold onto water due to their micro-porosity require a longer drying time after cleaning.

### Organic-shaped deposits

- A. Small irregular shaped deposits on the surface of the piece after coating or curing may be due to inadequate rinsing. Pouring deionized or distilled water over the piece during the rinsing process will help remove any crystals that could possibly form on the surface the acid dip (which could then be deposited on the workpiece when removing it from the acid dip). Make sure to include a rinse step with running deionized or distilled water over the piece to wash these crystals away.
- B. Make sure the acid dip is kept fresh; when not in use, cover it or put back into a safety container.