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Applying Kliar Nano-Ceramic E-Coating

Suitable for use with tanks/containers up to 10 liters and/or without the use of ultrafiltration.

Step	Required Products
1. Prepare the pieces to be coated by making a fixture with wire.	1. Thin, flexible copper wire (copper works best but other metal types are also usable) 2. Thin, hard steel wire 3. Cutters 4. Latex gloves
2. Clean pieces with electrocleaner/degreaser	1. Electrocleaner (requires heating and strirring; see electrocleaner instructions) 2. Rectifier (optimal voltage for electrocleaning should be around 6–12 volts) 3. Container for solution (glass or polypropylene) 4. Stainless steel anode 5. Magnetic plate (with agitation and heat function)
3. Rinse in still DI (deionized) water	1. DI (deionized) or distilled water 2. Container for water (glass or polypropylene)
4. Acid-Dip/Neutralization • 30 seconds in and out of solution creating turbulence	1. Neutralization solution or a 5% sulfuric acid and water mxture 2. Container for water (glass or polypropylene)
5. Rinse in still DI water	1. DI or distilled water 2. Container for water (glass or polypropylene)
6. Rinse under running water	1. DI or distilled water 2. Container for water (glass or polypropylene) 3. Squeeze bottle
7. Pre-dry the piece(s) in oven at 80°C/175°F for 10 minutes if the pieces are cast, metal clay, or are porous; all other pieces should be hung to dry or dried with compressed air	1. Convection oven or kiln/oven that can hold a consistent temperature
8. Let piece cool to room temperature	1. A place to hang the pieces
9. Submerge piece into ceramic solution with voltage off and agitate the piece in the solution to dislodge air bubbles and ensure 100% contact between metal and solution.	1. Nano-ceramic solution (do not heat solution) 2. Container for solution (glass or polypropylene) 3. Magnetic plate with good agitation (to stir solution and prevent clots) 4. Stainless steel anode

Step	Required Products
10. With piece still submerged, turn on the voltage with time and voltage set based on metal and coating desired	1. Rectifier (60-volt, 2-amp) with low-surge current and no ripple (NOTE: 50 volts is optimal for the e-coating process; rectifier must accommodate this voltage)
11. After 30 seconds (time in the solution may vary depending on the color you want to achieve), turn voltage off and lift piece from solution. Dip into DI water several times for first rinse	1. DI or distilled water 2. Container for water (glass or polypropylene)
12. Dip piece into a second beaker of DI water, dipping several times for the second rinse	1. DI or distilled water 2. Container for water (glass or polypropylene)
13. Rinse under running water, pouring DI water (do NOT use tap water) from a third beaker or squeeze bottle into an empty beaker	1. DI or distilled water 2. Container for water (glass or polypropylene) 3. Squeeze bottle
14. Dip into surfactant and remove	1. Rinse Aid surfactant 2. Container for solution (glass or polypropylene)
15. Hang piece(s) to dry until shiny and uniform; blot water as needed with paper towel or gently spray with compressed air)	1. Rack to hang pieces 2. Paper towel 3. Compressed air (optional)
16. Cure coated piece(s): Transparent—130°C/270°F for 40 mins. Colors—160°C/320°F for 30 mins.	1. Curing oven

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