The Electropolisher Series

MODEL E399-100

Combining the convenience of the Esma Electropolishing systems with an auxiliary tank and 100 amps power

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Features & Specs

Electropolishing Procedure

1. *Prepare Metal (Pre-cleaning). Ultrasonic cleaning is an excellent way to remove oils, debris and other impediments that will distort the polishing results*

2. *Electropolishing Process*

3. *Post Cleaning (Rinsing and drying). Important to remove the residual electrolyte and clean and rinse the part. Ultrasonic cleaning can again be used for this step, as well as warm air dying*

Electropolishing, sometimes called reverse electroplating, is an electrochemical process which polishes a metal surface by removing microscopic amounts of material from the work piece. Electropolishing is generally used to remove a very thin layer of material from the surface of a metal part. The process is of interest because of its ability to enhance the material properties of metal parts in addition to changing their physical dimensions.

Electropolishing offers a number of benefits to metal surfaces such as:

- Removal of impurities and improvement of corrosion resistance of a metal surface. (PASSIVATES)
- Improvement of the appearance of a metal surface (HIGH LUSTER)
- Improvement of the surface resistance to stain and bacteria.
- The microstructure of the surface can be more accurately inspected.
- Removal of surface defects improving the strength of certain metals.

In general the polishing process requires three important steps:

1. Pre-Cleaning (Prepare Metal). Ultrasonic cleaning is an excellent way to remove oils, debris and other impediments that will distort the polishing results
2. Electropolishing Process. Passage of direct electric current through part while submerged in electrolytic bath.
3. Post Cleaning (Cleaning and Rinsing). Important to remove the residual electrolyte and clean and rinse the part. Ultrasonic cleaning and rinsing should again be used for this step.

Esma's E399-100 provides up to100 amps of electropolishing power

Some of the features of our equipment are as follows:

- 304 stainless steel cabinet
- Digital controls.
- Thermostatically controlled electrolytic bath.
- Inert cathodes
- 48 Volt variable control transformer
- 100 amps current capacity at 24 VDC, 2400 watts
- Auxiliary tanks ordered to customer specs

Esma brand electrolytes include:

- Esma-Brite E272 electrolyte for cobalt-chrome
- Stainless Steel Electropolish E972 for Stainless steel (300 series)
- Nickel Electropolish E581 for high nickel alloys
- Bronze EP E1005 for brass, bronze and other copper alloys v Custom mixing upon request

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INSTRUCTIONS
FOR
ELECTROPOLISHER E399-100

Introduction

The E399 unit polishes stainless or chrome-cobalt alloys with a maximum current carrying capacity of 100amps. The unit has five polishing stations for 50 amp polishing and additional 100 amp terminals for hook up to a different polishing tank.

The unit, constructed of 304 stainless steel is built to give years of reliable, trouble-free operation. The cathodes and anode clips are built of non-corroding alloys. The polishing solution temperature is automatically controlled by heater-cooling fan combination. The unit is designed for production.

PLEASE READ CAREFULLY THE INSTRUCTIONS BEFORE OPERATING

Installation

Unpack, place unit on counter, and connect the tank cathodes to the studs protruding out from the cabinet next to the sides of the tank. Connect unit to 120VAC outlet. The unit is rated at 3200 watts, 120VAC, 50/60HZ and protected with an internal 30 amp/120vac fuse. The polishing cell is fused at 25 amp, 120VAC.

Pour the electropolishing solution into tank to one inch from top of tank. For stainless steel use Esma E972 and for chrome-cobalt alloys use Esma E272.

Safety Precautions: The system is designed with maximum safety features. The electropolishing solutions are mildly acidic solutions and certain precautions are recommended.

- Wear safety goggles when pouring the liquid into tank. If solution gets on your skin, rinse off with plenty of water. In case of eye contact-rinse off with plenty of water and seek medical attention.
- Solution will damage cloth and carpeting.
- A small amount of solution mist is emitted during polishing: avoid inhaling-install near exhaust or ventilated area.

Slide horizontal holding arm (8G) into each of the main posts (6D) and fasten with knurled screw (13A) of main post. The arm with clip (13C) is attached to horizontal holding arm, with part to be polished suspended into solution (diagram 1).

Operation

Turn the MAIN power switch and HEAT switch ON. Set the temperature controller to the proper temperature. Generally, 110° to 120° F is a good set point. See attached instructions for the OMRON E5GN controller. The unit has been set for 110° F with ON/OFF control. In approximately 20 minutes, when temperature gets within a few degrees of set point, the cooling fan will turn on and start proportioning.

TIMER

With the MAIN switch on, set the time with the up or down arrows. Push the start button and the process will start with the timer counting down to O. When the set time expires, an audible beep will sound for a few second.

50 and 100 amp polishing.

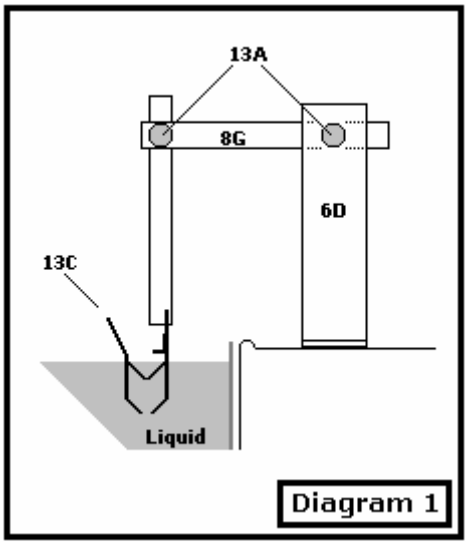
The tank incorporated in the unit is wired to accept 50 amp, 48VDC (not to exceed 1200 watts) polishing conditions. A box on the left side of the unit contains terminal for a secondary tank. These terminals are wired to accept 100 amp, 48VDC (not to exceed 2400 watts) capacities**. Red wire is connected to the (+) positive and the black wire to the (-) negative.** Both tanks can be operated at the same time as long as the total current does not exceed 100 amps or 2400 watts.

Make sure the terminal cover is replaced after the leads from the secondary tank is connected to the + and – terminals.

Polishing

- Suspend part to be polished on clip (13C); immerse end of holder into liquid so treated parts are fully submersed, tighten arm (13C) into horizontal arm with knurled screw (13A).
- Set timer for desired time and push START button to begin the polishing.

- Remove holder with polished parts, rinse in water.
- Neutralize part in baking soda solution (teaspoon of soda per cup of water).
- Rinse under running hot water, then air-dry.



Maintenance

Maintain clean cabinet: wipe off with cloth wetted with mild detergent; polish with a polish for stainless appliances (as Sheila Shine).

Solution should not be spilled on cabinet; shorting of post 6D may take place- wipe off !

Replacement of ESMA E972 or E272 Solutions; during polishing metal and metal oxides are dissolved, some decomposition and drag-out take place. Replace when action gets slow, solution thick, objectionable odor, non-uniform shine and rapid overheating.

Cleaning polishing cell:

- shut off unit and unplug power cord from outlet
- disconnect black wire on tank from black binding post on cabinet.
- slowly lift tank out of unit by holding front and back flanges of tank
- dispose of solution (dispose properly according to local regulations); rinse tank thoroughly with water, remove any film or build-up from inside, wipe tank walls with soft

towel or sponge. THE TANK IS COATED, SO DO NOT USE ANY ABRASIVE MATERIAL while cleaning inside the tank. Dry tank with towel, do not pour solution into wet tank.

Trouble Shooting

Problem	Possible Cause	Corrective Measures
Blowing fuse	-Part touching -tank cathode	- Re-position part
	-Solution spilled on cabinet and is wetting base of post	- Remove tank, loosen screw under post, remove post, rinse and dry all parts; reassemble making sure insulating washers are in place
	-None of the above	-Contact manufacturer
Odor emitted during heat up	-Solution present on heating plate	-Shut off unit, remove tank and clean up any solution on heating platform
	-Leaking of tank	-If repeated clean-ups do not eliminate odor tank may be leaking
	-Solution needs exchange	-Replace with fresh solution

For technical assistance please call 1-800-276-2466