



ELECTROPOLISH PROCEDURE

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Electropolishing is an electrochemical **process** that removes material from a metallic workpiece. It is used to polish, passivate, and deburr metal parts. It is often described as the reverse of electroplating.

THIS CHEMICAL TREATMENT PROCESS IS EXTREMELY HAZARDOUS AND ONLY TRAINED PERSONNEL ARE AUTHORIZED TO PERFORM PROCESS & MAINTENANCE.

The Electropolish process at Island Tool & Die, Inc. consists of 9 tanks numbered left to right. The tanks are numbered to correspond with each individual step in the process.

Ex. Tank 1 is step one
Tank 3 is step three

*Note - YOU CANNOT START ANY STEP WITHOUT HAVING DONE THE PREVIOUS STEP

Procedures for electropolish are as follows:

- Maintenance & fluid replacement
- System startup and checklist
- Performing electropolish
- System shutdown

MAINTENANCE

- ANY PERSON PERFORMING MAINTENANCE SHOULD PROTECT THEMSELVES IN THE FOLLOWING WAY:
 - HANDS AND ARMS - USE THE APPROVED GLOVES
 - FACESHIELD
 -
- BEFORE PERFORMING ANY MAINTENANCE DISCONNECT ALL POWER SOURCES TO THE RECTIFIER, HEATERS, AND THE VENTILATION SYSTEM.
- ALL BATHING TANKS SHALL BE CLEANED EVERY **12 MONTHS** EXCEPT THE ELECTROPOLISH BATH WHICH CAN BE CHANGED OUT **EVERY 18 MONTHS.**

FLUID REMOVAL

1. THE TANKS LABELED DI WATER SHOULD BE PUMPED OUT FIRST
2. ONCE THE DI TANKS ARE PUMPED OUT, FLUSH THE PUMP AND PAIL WITH FRESH WATER
3. PUMP OUT THE NITRIC ACID. THE NITRIC ACID WILL BE DISPOSED OF IN A SAFE CONTAINER LABELED "NITRIC ACID WASTE"
4. ONCE THE NITRIC ACID IS REMOVED FLUSH THE PUMP AND PAIL WITH FRESH WATER
5. PUMP OUT THE ELECTROPOLISH INTO A SAFE CONTAINER LABELED "ELECTROPOLISH WASTE"
6. FLUSH THE PUMP WITH FRESH WATER
7. CLEAN THE DEFLECTOR PLATES AND REMOVE ALL VISIBLE CORROSION WITH SOAPY WATER.
8. DISCONNECT THE POWER TO THE ELECTRODES.
*****ENSURE THAT ALL POWER IS OFF BEFORE DISCONNECTING**
9. CLEAN THE COPPER ELECTRODES AND REMOVE CORROSION WITH SOAPY WATER.
10. DRY ALL PARTS THAT HAVE BEEN CLEANED
11. RECONNECT ELECTRODE AND PLACE DEFLECTOR PLATES BACK IN TANK

FLUID REPLACEMENT

TANK 1: HOT SOAP BATH tank capacity 7 gallons
1 gal DI Water : 2 -1/2 teaspoons Alconox

TANK 2: DI WATER RINSE

TANK 3: ELECTROPOLISH BATH
Fill to 2" below copper electrodes

TANK 4: DI WATER RINSE

TANK 5: DI WATER RINSE

TANK 6: NITRIC ACID BATH
The solution should be 28% Nitric Acid

TANK 7: DI WATER RINSE

TANK 8: DI WATER RINSE

TANK 9: HOT DI WATER RINSE

SYSTEM STARTUP

Before startup, check tank fluid levels. All tank levels should be 2" below the top of the tank. Add where needed.

Turn the heaters and rectifier on. Set the temperatures for the heated tanks. Allow 15-30 mins for tank to reach proper temperature.

9.5 volts, 100 amps is what the rectifier should be set at.

Flip on the electric switch box on both heater then flip on the heater control panels then plug in electropolish heater #2.

Hot water baths = 140 degrees (Heaters 1 & 3)

Electropolish bath = 110 degrees (Heater 2)

Turn on switch to exhaust system.

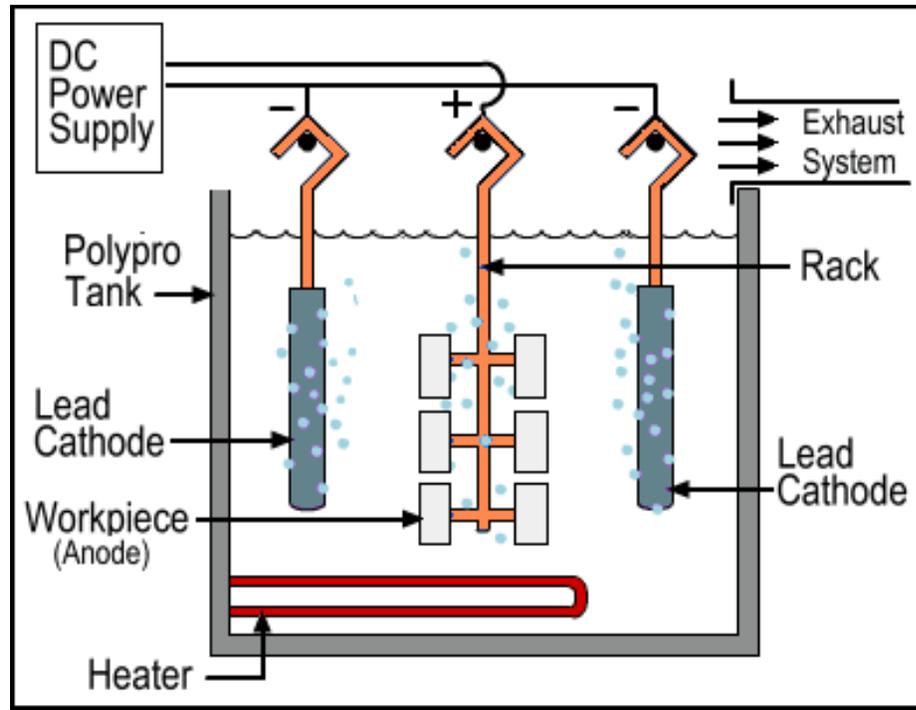
EXHAUST SYSTEM BE ON DURING ENTIRE PROCESS

PERFORMING ELECTROPOLISH

****clean parts by hand and try to get as much off them as possible before beginning process**

1. TANK 1- HOT SOAP BATH
 - a. Fit with proper holding device
 - b. Submerge and rotate for 5 minutes
2. TANK 2- DI WATER RINSE
 - a. This tank is used to rinse residue from soap bath
 - b. Transfer parts from tank 1 to tank 2 and swish around for 1 minute.
3. TANK 3- ELECTROPOLISH BATH
 - a. Generally, parts are submerged for 20-30 seconds then removed
Depending on the material, cubic inches, and # of parts
They may need to be submerged longer
4. TANK 4 - DI WATER RINSE
 - a. Once the EP bath is complete, submerge rack into tank 4.
This will remove excess contaminants.
Swish around in tank for 1 minute
5. TANK 5 - DI WATER RINSE

- a. Tank 4 & 5 are designed to make sure parts are clean and free of anything that may be left over from EP bath
- b. Thoroughly rinse for 1 minute



6. TANK 6 – NITRIC ACID BATH

- a. The max time a rack should be in the acid is 2 to 3 seconds. If submerged too long, it could cause etching or blemishes.

7. TANK 7 – DI WATER RINSE

- a. Make sure you rinse part thoroughly after acid bath just to make sure you are getting all parts acid free. Rinse 1 minute then transfer to the next rinse tank.

8. TANK 8 – DI WATER RINSE

- a. This tank reduces any chances of remaining contaminants. Submerge parts for 1 minute rinsing thoroughly then transfer to hot water rinse.

9. TANK 9 – HOT DI WATER RINSE

- a. Submerge parts for 1 minute while constantly moving rack back and forth. Remove rack of parts and blow any water excess from parts including holes, slots, etc. Water stains are not acceptable and part must be free of finger prints or any other marking. Wrap in paper towel and bag.