

Davis-K

NO TARN 15

NO TARN 15

Description

NO TARN 15 is an after-treatment process which effectively protects Silver from oxidation and tarnishing. Used as directed, it forms a thin, invisible film on the surface which blocks exposure to the environment and resists corrosion. The film has no detrimental effect on the electrical properties of the treated metal, and no adverse effects on Solder ability and electrical properties.

Features and Benefits

- 1) Resists Tarnish and Oxidation
- 2) Easy to set up, Economical to operate solution. Ideal product for getting your Silver Jewelry to the end user in with its original finish intact.
- 3) Simple Immersion Bath: No Rectifier needed 1 to 2 minutes at 49C Temp, 1 liter makes 8 liters of solution. 1 Liter of concentrate can protect 42 SQUARE FEET of work surface. (6408 square inches) Longer immersion at lower temp provides additional protection.
- 4) Under ordinary conditions, can provide continuous protection until the product is sold to the end user. Easily protects 6 months to over 1 year in a “sitting on display” environment, but a few months or less when in use and under conditions where the part will be continuously “rubbed”.
- 5) Can be used on Silver AND Gold. Protects gold from blackening during shipping due to reaction with box chemicals.

Equipment Required

Tank Materials: Temperature-stabilized translucent **White Polypropylene**, **Polyethylene**, **Rigid PVC** or other materials that will not contaminate the system.

Heaters: **Quartz**, **Teflon coated** or **Stainless Steel** is recommended.

Filtration: Continuous solution filtration using leached 1 - 5 micron woven polypropylene cartridges with a flow rate of three to five times the tank volume per hour is recommended. If no filtration system available, solutions should be stirred often to prevent separation.

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Agitation: Gentle agitation required. If available, use slow moving pump to recirculation the bath, OR use low pressure oil-free air plus mechanical reciprocation to produce flowing action of the solution through the holes.

Racks: Plastisol or Halar coated

Equipment Preparation

Tanks:

Prior to makeup, the process tank and ancillary equipment should be thoroughly cleaned and then leached with a Sulfuric Acid solution.

This procedure is particularly important for new equipment or equipment previously used for other processes.

Cleaning Solution

Trisodium Phosphate (TSP) 22.5 - 45 g/l 3 - 6 oz/gal

and/or Sodium Hydroxide 22.5 - 45 g/l 3 - 6 oz/gal

Sulfuric Acid (H₂SO₄) 100 ml/l 10% v/v

Cleaning/Leaching Procedure

1. Thoroughly wash down the tank and ancillary equipment with clean water.
2. Re-circulate the water through the complete system to remove water soluble materials.
3. Discard the water.
4. Add the **Cleaning Solution** to the tank, and heat to 38 - 50 °C (100 - 120 °F) and re-circulate through the complete system. Leave the **Cleaning Solution** in the tank for 4 - 8 hours.
5. Discard the **Cleaning Solution**.
6. Re-circulate DI water through the complete system.
7. Discard the DI water.
8. Add the **Leaching Solution** to the tank and re-circulate through the complete system for 4 - 8 hours.
9. Discard the **Leaching Solution**.
10. Re-circulate DI water through the complete system.
11. Discard the water.

Polypropylene filters cartridges:

1. Wash thoroughly in hot (140 F, 60 C) de-ionized water.
2. Leach with 10% v/v (100 ml/l) sulfuric acid (H₂SO₄) solution for eight (8) hours.
3. Rinse thoroughly with de-ionized water.

SOLUTION MAKEUP Add 7 liters of DI Water to 1 Liter of Concentrate, (unless otherwise marked on the bottle)

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Chemicals Required	1 liter	1 gallon
Deionized Water	500 ml	50% v/v
NO-TARN 15 Concentrate	125 ml	12.5% v/v
De-ionized Water	---BALANCE---	

MAKEUP PROCEDURE/ORDER OF ADDITION

1. Add DI water to tank equal to 50% (500 ml/l) of final tank volume.
2. Slowly add NO TARN 15 Concentrate and mix thoroughly.
3. Bring the tank to final volume with DI water.
3. Analyze and adjust both the NO TARN Concentrate concentration and solution pH.
4. Adjust the solution to operating temperature.

OPERATING PARAMETERS

Metric

	<u>Range:</u>	<u>Optimum:</u>
NO TARN Concentrate	4.7 – 7.5 g/l	6.0 g/l
pH	6.0 – 10.0	Dependent on application
Temperature	21 – 52 °C	49 °C
Time	1 – 3 Minutes	2 minutes
Agitation	Mild work agitation, and solution agitation suggested	

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<u>Range:</u>		<u>Optimum:</u>
NO TARN Concentrate	0.63 – 1.00 oz/gal	0.80 oz/gal
pH	6.0 – 10.0	Dependent on application
Temperature	80 – 125 F	120 F
Time	1 – 3 Minutes	2 minutes
Agitation	Mild work agitation, and solution agitation suggested	

COMPONENT DESCRIPTION

NO TARN Concentrate: Functions as the primary addition agent for operation, and should be maintained and replenished based on solution drag-out or analysis using the attached Analytical Procedure.

pH: Working solution pH should be maintained in the range of 6 - 10 (see above) by addition of Glacial Acetic Acid or Ammonium Hydroxide. Use pH Meter.

Process Sequence: Freshly plated work may be treated directly after plating. All other work should be cleaned prior to coating with No Tarn 15 to insure complete tarnish/oxidation resistance.

No Tarn films do not resist abrasion or rubbing; hence it is desirable to protect these films with some sort of lacquer if they are going to be rubbed or abraded prior to final use/destination. Do not pack treated parts loose in boxes to ship ground, for example.

Typical Activation Cycle:

If you are planning to plate Silver parts that have been “sitting”, that are not immediately fresh from Plating, you will need to Activate the parts prior to applying Anti Tarnish.

Do NOT process parts that cannot pass the WATER BREAK Test! (You shouldn't even plate parts that resist water) Contact Davis K for details of the Water Break Test.

1. Acid Clean with NO TARN Acid Pre Dip, or 5% Sulfuric Acid, (H₂SO₄) for 1 minute. Perform Water Break Test in your final water rinse. Part wets properly? If not, Ultrasonic Clean, Electro clean, and Activate AGAIN.
2. Cold Water Flowing Rinse, 24° C, 1 – 2 minutes
3. Cold Water Rinse, 24° C, 1 – 2 minutes
4. Follow Steps Below

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Ideal Application Cycle:

1. Silver or gold electroplate.
2. Cold water rinse
3. Acid dip (5% v/v sulfuric acid or nitric acid)
4. Cold water rinse
5. Anti-Tarnish, No Tarn 15, , 49° C, 2 minutes
6. Cold Water Dead Rinse, 24°- 60° C, 1 – 2 minutes
7. Cold Water Rinse, 24°- 60° C, 1 – 2 minutes
8. Warm Water Rinse, 24°- 60° C, 1 – 2 minutes
9. Dry with warm air.

RECOMMENDED REPLENISHMENT AND CONTROL SCHEDULE

Component	Analytical Method	Frequency of Analysis	Estimated Replenishment Rate
No Tarn Concentrate	Volumetric Titration	Daily	Based on Analysis
pH	pH Meter	Daily	Based on Analysis
Metallic Contamination (Ag, Au, Ni, Cu)	Atomic Absorption Spectroscopy	Weekly	N/A
See attached Analytical Methods			

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TROUBLESHOOTING INFORMATION

Defect	Cause	Correction
Water break/poor coverage after application	Insufficient dwell time	Increase dwell time
	Temperature too high	Reduce operating temperature
	Concentration of NO TARN Concentrate is low	Increase concentration of NO TARN Concentrate
Tarnish (After performing Ammonium Sulfide Test – see attached procedure)	Temperature too high	Reduce operating temperature
	Insufficient dwell time	Increase dwell time
	Concentration of NO TARN Concentrate is low	Increase concentration of NO TARN Concentrate

IMPURITIES

The maximum tolerable level of contaminants is listed below:

Cu 1000 ppm

Au 50 ppm

Ni 1000 ppm

Ag 50 ppm

BATH LIFE NOTES

As an approximation, a bath which is used for 8 hours/day should be changed every three months. Periodic carbon polish will help to extend the bath life. The presence of some brown stains on the deposit is an indication that the NO TARN process is no longer effective.

It is not necessary to filter No Tarn, but filtering will extend the bath life, as it removes organic buildup from prior cleaning processes that can prematurely “tire” your bath. The Acid Activation rinse is critical to keeping your bath clean and long lived, change it often, and keep it replenished.

HANDLING PRECAUTIONS

BEFORE HANDLING ANY CHEMICAL PRODUCTS, IT IS IMPORTANT TO READ THE APPROPRIATE MATERIAL SAFETY DATA SHEET.

When handling chemicals, always wear the prescribed protective clothing as detailed in the appropriate Material Safety Data Sheet.

In case of skin contact, flush affected area with copious amounts of cold, clean water for at least 10 minutes. In case of serious exposure, particularly for eyes, obtain medical attention

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STORAGE

Store all chemicals in upright, original containers away from direct sunlight and in a dry area at 50–90° F (10–32° C). Keep container closed when not in use.

WASTE TREATMENT

It is the user's responsibility to verify that treatment procedures comply with federal, state, and local regulations. Working solutions should be diluted, neutralized and disposed of in accordance with local and federal regulations. Consult your local agencies for recommendations for your area. Consult your Technic Inc representative for further information.

Analytical Procedure for NO TARN 15 Concentrate

NOTE: There is a "Quickie" test for determining that you are applying No Tarn to your parts, and to tell the operators when it is time to replenish: The SHARPIE TEST: Apply a mark from a Sharpie (black marker) to ONE Untreated part, and to a dried part with NO TARN applied. REMOVE the mark with a piece of soft toilet tissue. The mark will come off much easier from part with the NO TARN on it. The operator, with practice, can tell the difference between a fresh bath and a bath that needs to be replenished, by doing this quick test often.

Reagents for Analytical Procedure:

0.1 N iodine solution
 HCl concentrated
 Sodium bicarbonate (reagent grade)
 Starch indicator solution

Procedure:

1. Put 100 ml of de-ionized water into a 250 ml Erlenmeyer flask
2. Add 50 ml concentrated HCl
3. Pipette 10 ml of the working bath into the Erlenmeyer flask and add 3-5 drops of 2-octanol
4. Add 10 ml of Starch indicator solution
5. Add 2g of Sodium Bicarbonate
6. Titrate with 0.1N iodine solution to a faint blue endpoint
7. Record the volume (ml) of iodine solution used

Calculation:

No Tarn Conc (ml/l) = ml of iodine used x 12.5

Determination for the Presence of NO TARN Film - Ammonium Sulfide Test

Equipment

1 ml Transfer Pipette
 1000 ml volumetric flask
 Eyedropper

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Chemicals

Ammonium Sulfide (light), Reagent Grade, 20 -24% v/v

Procedure

1. Pipette one ml. of 20 to 24 percent ammonium sulfide (light), reagent grade, into a one-liter volumetric flask. Fill to the mark with distilled water and agitate thoroughly.
2. Next, place one drop of the solution on a specimen without No Tarn 15, tarnish resistant coating, and label it grade B.
3. Lastly, place one drop on a specimen with No Tarn 15, supplementary tarnish-resistant coating and label it grade A.

Results

1. The drop on the sample labeled grade B specimen, should begin to show a black or brown color in about one minute. Since this specimen did not have No Tarn 15 applied, the specimen is deemed failed.
2. The drop on the sample labeled grade A specimen, should not show discoloration for 2.5 minutes. Since this specimen has No Tarn 15 applied, the specimen is deemed passed.

Conclusion

Parts that have been immersed in No Tarn 15 for at least 2 minutes at 49°C should successfully withstand contact with Ammonium Sulfide, as stated above, for 2.5 minutes.

For additional protection, parts treated for 10 minutes at 35°C will withstand contact with Ammonium Sulfide for 5 minutes.

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