

SCHEDULE NO. 1

Initially used to provide a semi-matte finish on molybdenum strip to be used in the form of power tube plates to increase radiation and improve adherence of miconium spray.

## 1. EQUIPMENT

- a. Circular wire mesh jig with 6 radiating rows of 17 pegs per row to hold strip.
- b. Four large containers for acid solutions and rinsings.
- c. Drying oven.

## 2. MATERIALS

- A24 Sulfuric Acid, Technical  
A18 Nitric Acid, Technical  
Tap Water.

+

\* DANGER

SULFURIC ACID HANDLING PRECAUTIONS: See S.N. 33-2-7C.

NITRIC ACID HANDLING PRECAUTIONS: See S.N. 33-2-7C

## 3. FORMULA &amp; MAINTENANCE

A reasonably stable solution consisting of 4 parts water, 5 parts nitric acid to which 6 parts of sulfuric acid are added is to be used at room temperature for the etching of moly strip. An acid dip between 4 and 5 liters of a 4-5-6 solution is required to etch about 5 kilograms of molybdenum strip.

While molybdenum is not attacked rapidly in this solution, the nature of the etching acid is such that if acid covered molybdenum is exposed to the air, it deteriorates rapidly. In order to obtain an oxide-free matte finish, a sulfuric acid dip must follow immediately after the 4-5-6 solution dip. Here also, 4 to 5 liters of sulfuric acid is required to etch a 5 kilogram batch of molybdenum strip. These oxides are water insoluble, and must be removed by immersion for an extended length of time in conc. sulfuric acid. (Solutions should be kept covered because of the water-absolving property of sulfuric acid.)

## 4. PROCEDURE

- a. Coil molybdenum strip upon pegs of fixture. (Adjacent coils will be spaced approx. 1/4" to permit free circulation and drainage.) Lower jig into container with acid etching solution (4-5-6 solution) covering strip to about a depth of 2". Lower for 3 to 5 seconds (less time for older solution). Raise above solution for gassing to start (2 or 3 seconds); return to solution. Procedure repeated 3 times.
- b. After strip has been in solution 3rd time, transfer immediately to sulfuric acid dip, rinsing therein 5 to 10 minutes.
- c. Cleaned etched strip is allowed to drain and rerinsed thoroughly in rapidly running water (5 to 10 minutes).
- d. Dry in oven 100° ±10°C. for approximately 10 minutes.

SUBJECT ACID ETCHING MOLYBDENUM - with  
4-5-6 Solution

SUPERSEDED DATE 11/8/45

## 4, PROCEDURE (Cont.)

NOTE: The efficiency of the conc. sulfuric acid rinse following the 4-5-6 acid etch will be reduced, in time, due to carries from the etch. Addition of acid or complete change is therefore necessary as noted in item 3. With this equipment it is possible to etch 20 to 25 ft. of molybdenum strip at one time.

SCHEDULE NO. 2

\*For parts fabricated of molybdenum which has not been previously etched.

Adapt Schedule No. 1 using glass beaker or crock with drain holes in bottom in place of circular peg rack. Parts must be so arranged therein to facilitate complete drainage of acids.

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ENGINEERING SECTION  
STANDARDIZING

\*\*\* Sch. #3 recalled.