

SUBJECT PROCESS FOR BLASTING SURFACES WITH  
ABRASIVE MATERIALS ( Hand Process )

DATE Feb. 12, 1948 PAGE 1

STANDARDIZING NOTICE 34-34-2B

SUPERSEDED DATE 7/4/45

The herein given process for etching surfaces of metal or glass parts by blasting them with silicon carbide grains or steel grit is standard.

1. USES FOR BLASTING PROCESS: Examples of parts on which surfaces may require etching or roughening and the purpose of the treatment are:
- Flare tubing on stems- To provide roughened surfaces to prevent a grid or plate support collar from slipping when attached to stem.
  - Plates and grids- To increase area of radiating surfaces in order that parts will better radiate heat and operate at a lower temperature.
  - Stems in region of press and lead wires - To etch glass between lead wires to increase surface area and therefore increase path of electrical leakage. During this operation lead wires may also be cleaned by blasting them to remove oxides resulting from stem making.
  - Wire terminals such as external grid and plate leads - To clean ( remove oxides ) external lead wires on tubes after exhaust, when the use of an acid cleaning process is not practical.

## 2. EQUIPMENT

- Blasting machines Model #R1098 (unit #1 with jet in horizontal position and #2 with jet in vertical position) operating on 40 to 70 lb. air pressure and using 3/8" I.D. blast nozzles. Blasting chambers of machines are equipped with glass windows and are lighted inside to permit observations to be made while blasting parts. Since windows gradually become etched by abrasive material, spare panes of glass must be kept on hand for replacement purposes.
- Dust collecting equipment connecting to sand blasting machines.
- Air filter - Such as a vertical pipe, about 7" O.D. x 6' long between flanged ends, packed with cotton waste. Repack pipe with new waste about every 6 months.
- Loudded or other form of rubber parts to fit on glass parts, such as flares and cover those portions of glass which are not to be blasted.
- Rubber mandrels for holding parts.
- All-metal mandrel when shape of part makes use of rubber mandrel impractical
- wire baskets for use inside of blasting chamber.
- Rubber gloves to protect hands while holding parts inside of blasting chamber
- Metal stopper- Inserted in top of stem assembly when blasting stems for cathode-ray types

3. MATERIALS:
- S106 Silicon carbide grains No. 70 GG or A614 Blastite grains, No. 80 (req'd. for all C.R. stems).  
S104 Angular steel grit No 60.

- A. Use Silicon Carbide normally for blasting parts made of following Materials:
- Molybdenum parts having riveted seams or joints, etc. At present all molybdenum parts requiring blasting are in this class.
  - Tantalum parts which after washing in water and before mounting can, by firing in vacuum, be sufficiently freed of embedded silicon carbide to prevent objectionable discoloration in tubes or poor life test results. At present silicon carbide has a very limited use for blasting tantalum.

‡Indicates a correction



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ABRASIVE MATERIAL (Hand Processes)

SUPERSEDED DATE 5/22/43

### 3. MATERIALS (Cont'd)

NOTE: To avoid contamination with other metals, tantalum and molybdenum parts shall not be blasted with silicon carbide which has been used for blasting metals such as mentioned below in item 3.

3. Other metal parts of materials such as copper, nickel, chrome-iron, or cobalt-nickel-iron alloy.

\*\*A. Use of blastite #80 is suggested in blasting cathode-ray stem leads.  
NOTE: For blasting metal parts other than tantalum or molybdenum a separate lot of silicon carbide should preferably be used for each kind of metal, and particularly for copper, to avoid contamination of parts with other metals.

4. Glass - Bulbs, Flares, Stems, etc.

NOTE: Silicon carbide which has been used for metal parts may generally be used for glass parts. However, for stems to increase path of electrical leakage between lead wires the silicon carbide should not be contaminated with metals.

B. Use steel grit for tantalum parts other than those which may be safely blasted with silicon carbide. Steel blasted tantalum parts must be acid washed to remove embedded iron and be fired in vacuum at a temperature as high as possible. Most tantalum parts are blasted with steel grit.

### 4. PROCEDURE

- a. Use abrasive material to suit requirements of parts to be blasted.
- b. Adjust air pressure to obtain a grit flow which is not strong enough to cut material too rapidly, and in case of grids, to distort the turns.
- c. Adjust damper in vent to exhaust system so that no dust will blow out of hand holes of blasting machine. For efficient operation of dust collector, empty it at least once a day as per instructions on side of dust collector. Discard this material.
- d. Place small plates on a rubber mandrel, hold grids and large plates in hands and cover parts of glass, which are not to be blasted, with rubber. In blasting stem assemblies for cathode-ray tubes, insert metal stopper into top of stem tubulation until flange of large diameter rests against flare.
- e. In general, hold parts about 4" - 6" from end of gun nozzle, rotate and move parts laterally in grit stream at a speed of variable rate and uniformity, depending upon shape of part. For cathode-ray stems, hold stems so that lead wires are at right angle to flow of abrasive and about 3/4"-1-1/2" from nozzle. In case of stems such as FSE2D, FSB19A, and FSB20A entire flare is to be protected by a metal sleeve. Flare face to be protected to make a snug fit to stretch paper tightly over flare. In all other cathode-ray stems, blast flares to increase path of electrical leakage and to prevent reflection of light to screen.
- f. Continue blasting until original surface of metal or glass has been entirely removed.



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SUPERSEDED DATE

4. PROCEDURE (Cont'd.)

- NOTES:
1. Add new abrasive material, as required, to replace that which is lost during blasting operation. For most efficient operation, load machines with abrasive material to last about 1 hr. for unit #1 and 1-1/2 lb. for #2.
  2. It is not necessary at any time to discard abrasive materials, but the use of silicon carbide may become limited as result of its previous use, as explained in Sec. 3.
  3. The blasting gun nozzle may be used until the walls are worn thru. If the nozzle does not wear uniformly it should be turned periodically.

STANDARDIZING SECTION  
ENGINEERING DEPT.

PC14281, L-174-35 /bw