

5/28/47 STANDARDIZING SEC., ENG. DEPT. K2cK  
LANCASTER, PA., U. S. A.

DATE Apr. 23, '42 PAGE 1

STANDARDIZING NOTICE 34-17-5C

SUBJECT SEALING WINDOWS TO METAL BULBS

SUPERSEDED DATE

Herein are standard steps by which glass window for metal bulb, such as used for type 913 tybe, shall be prepared and sealed in.

## 1. MATERIALS

- a. 33-G-53 Glass or as specified.
- b. Partial bulb assemblies, such as FMT10A3-6.
- c. Hot tap water.
- d. Filtered high pressure air.
- e. 35-A-53 Acetone

## 2. EQUIPMENT

- a. Glass cutting machine, such as G. W. Klages & Son Inc. hand operated machine No. 381.
- b. Aluminum beaker (1-liter)
- c. Air filter, air transformer, air hose and blow gun.
- d. Sealing machine, such as a single head machine with six #693D burners (mounted on a movable arm) in a horizontal arc of about 200° with jet ends 20mm from bulb when latter is placed on revolving spindle. Flames (gas-air-oxygen) are 6mm long with 10mm cones and are directed at chrome iron flange. Air for forming the window, is admitted to bulb thru spindle. Spindle speed - approx. 40 R.P.M.
- c. Diagonal cutting pliers, flat nose pliers, glass working tweezers, etc.

## 3. PROCEDURE

### A. CUTTING GLASS FOR WINDOWS

- a. Adjust position of cutting wheel on rotating arm of glass cutting machine so that it will cut glass discs of specified diameter.
- b. Place glass (strip) on wooden platform of cutting machine and cut circles on surface of glass, by pressing down on hand crank, making one complete revolution for each circular cut. Circles should be cut so that they will be about 1/4" apart and about same distance (1/4") from edges of strip.
- c. To remove glass discs from surrounding glass, nip both edges of strip of glass, where circular cuts come nearest to edges, with diagonal pliers. Use flat nose pliers to trim away glass which may not have been completely removed from edges of discs.
- d. Reject any discs which are cracked, chipped, scratched or otherwise defective.

### B. WASHING GLASS DISCS

- a. Place about 50 glass discs into an aluminum beaker and wash parts by agitating in hot tap water for 1-2 minutes. Discard water.
- b. Cover glass discs with acetone and rinse well under under a hood by shaking beaker. Discard acetone.

NOTE: To insure thorough washing and rinsing make sure that glass discs do not stick together.



3. PROCEDURE (Cont'd)

B. WASHING GLASS DISCS (Cont'd)

c. Dry discs by blowing with filtered air while shaking the beaker. Too much air will blow discs out of beaker.

C. SEALING GLASS TO CHROME-IRON FLANGE

a. Wipe any dust or foreign material from glass disc with a clean cloth and, handling disc by edges, place it into chrome-iron flange of partial bulb assembly.

b. When machine is ready for operation, place partial bulb assembly with glass disc in place, on revolving spindle and swing fires in movable arm so that they play on center of chrome-iron flange. The flame from 1 burner must be directed at top of flange in order to heat glass disc.

c. Allow bulb to heat to a bright-orange color (approx. 940°-980°C.). This should take about 40 sec. At this point the color of glass and flange should be the same. If necessary, the glass disc may be seated more firmly in flange during this period, by touching it lightly around edges with glass working tweezers before glass becomes too soft and sticky.

d. Admit air gently into bulb. If glass rises concentrically, swing fires away from bulb and flow glass upward into a convex form about 1/8" above flange. If glass rises unevenly, shut off air and heat further and then again admit air gently as before. Length of additional heating period will have to be determined by experience.

e. When glass has been blown to specified height, reduce pressure to a point which will maintain glass to desired level and hold (about 15 secs.) at that pressure until glass has set.

f. Remove from spindle and allow to cool with window upward.

g. When seal is cool, inspect for cracks, bubbles at seal, scratches, etc. A good seal will be found to have a dull greenish brown color. Salvage all rejected assemblies by removing windows and repeating above procedure.

Note: The maximum time required for complete sealing operation should not exceed 1-1/2 minutes, since excessive heating will oxidize bulb and cause it to become porous at heating zone.

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