Report on Visit to Lansdale Tube Plant
Lansdale, Pennsylvania

Mr.Bailey and I arrived at the Lansdale Tube Plant, Monday morning, January 31, 1949, at 10:30. We met Messrs. J. Vansant, Palmer, Carter,and Hindman.

Mr. J. Vansant conducted us through a general tour of the plant. I spent approximately two hours in the 16" metal tube sealing department.

Their equipment consists of two large Model EE Litton horizontal lathes, one experimental vertical lathe, and one Sylvania vertical window-sealing lathe with automatic controlled operation. This lathe was designed and built by Sylvania. Equipment also included one large electric oven also built by Sylvania.

1. Pre-heating and sealing of the face of the 16" tube.

The Sylvania built vertical lathe was used for this operation. It stands approximately two feet from the floor. The circular burner manifold of about 16 inches in diameter consists of 37 vertically-mounted oxygen-gas American Gas Company Burners No.914-D and 11 No.914-D burners mounted horizontally and directed at the lip of the cone. These burners are mounted on 2" manifold.

Three gas-air bunsen type burners play on the window and one directly under the metal lip of the cone during the pre-heating and sealing operation on the cone.

A prolonged heating cycle is used to avoid pockets which have caused drying and screening difficulties. In this operation the window is sealed beyond the inner lip edge. The operator blows irregularly during the latter part of the sealing

operation and tries to keep the window from sagging down into the cone by a regulated foot-control air-pedal. The glass seals are fairly flat, which they attribute to the high speed of their machine (65 R.P.M.). This speed may flatten the glass centrifugally but it also accentuates the out of camber effects of the windows during the sealing. This is important since almost all the windows are out of camber because of the sagging operation of these windows.

In order to ascertain the results of this prolonged heating and high speed, I examined approximately twelve seals internally and found that: the glass creeps down along the metal cone forming a folding over bead of glass. This effect greatly increases the possible shrinkage due to circumferential checks or cracks that are provoked by this beaded glass condition. In certain cases the effective picture area is decreased due to some shadowing effects of blown pockets directly about the rolled glass that has beaded or run down the cone at the innerlip seal. Thus it is seen that although sharp pockets are avoided, I would suspect that they are experiencing a high shrinkage. Approximately 75 metal cones with cracked window and neck seals were observed in the salvaging department. I was informed that they had only a 5% shrinkage.

One hundred tubes a day are made in three shifts with three operators per shift. No one present could tell me their heating cycle, so I would guess that the window sealing cycle is approximately 5 minutes (from two to three minutes preheat and approximately two minutes sealing). The oxide color

of these seals is an emerald green. This may be a desirable color, but the importance that this color plays in the seal is questionable, in my opinion. The window seal is then placed in an electric oven for 5 minutes at 550 degrees C. and room-cooled immediately.

2. Pre-heating and sealing of the neck of the 16" tube.

The glass funnel cone seals are made on the large Litton hrizontal lathe. The chucked window sealed cone is pre-heated at the face and metal "lip" by large bunsen burners (12" bluish flame), until the operator can just barely put his hand on this zone. I questioned the foreman as to the practicability of heating the window in this way, and he stated that seals which have gone down too far along the inner lip will crack occasionally due to this bunsen burner pre-heating of that zone. The neck glass assembly is then heated with a large cannon fire for approximately five minutes. This seal is made with 6 large Litton gas-oxygen burners (7 tips to each burner). The finished seal is annealed with a 6" diameter gas stove type burner (bluish flame) for 5 minutes. The face pre-heating bunsen burner is turned off when the neck annealing operation is started. The oxide color of the neck seals is sort of a brownish color. The bulb is then placed in a transite lined box and hot or heated air is blown through a metal tube in the center of the cone. In checking these seals with a polariscope, I observed sharp strain patterns in the neck seal. The window seal strain patterns are similar to ours.

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During my approximate half-hour observation of the neck sealing operation four windows cracked due to this bunsen burner pre-heating. They estimated approximately 5% neck sealing shrinkage.

The cleaning and sand-blasting of these cones is similar to our method with two exceptions:

1. The use of Carborundum No. 80 T.P. aluminum oxide instead of silica sand.
2. Air-blowing the sand-blasted area, instead of our method of hot water brush washing and drying.

They attribute the emerald green color of their seals to the use of this No. 80 T.P. aluminum oxide instead of silica sand. G.E. stated that they had experienced trouble with their seals when carborundum was accidentally mixed with the silica sand in their sand-blasting operations. I was told that Lansdale is using 300 lbs. a day at 13 3/4 cents per lb. for their new and salvaged metal cone sand-blasting operations.

Notes:

1. All television bulbs are washed in an enclosed machine using 5% H.F. acid high-pressure pump nozzle inner spray for a few minutes. This high-pressure washes the aquadag and fluorescent screens of salvaged bulbs very satisfactorily. From this enclosed machine, the bulbs are washed with hot water and finally given a distilled water rinse.

2. We were told that very little shrinkage was experienced due to cracked side contacts or buttons, also that

there is no salvaging of the cracked buttons that do occur, the bulbs supposedly being destroyed instead of salvaged.

3. The glass bulb salvaging department consists of two horizontal Litton lathes model H.S. One lathe is being used to make the glass funnel to neck splices for the 16" metal tube bottom seal. The other is for splicing neck to the salvage glass bulb. These splices are annealed for 2 minutes with a smoke flame from the sealing burner on the lathe.

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