J. C. Sparrekens

T4

TRIP REPORT

Destination: Landale Tube Co., Lansdale, Pa.
Date of Contact: January 26 - 28, 1955.
Personnel Contacted:

M. Sadowsky	H. Colgate
M. Groner	G. Pratt
D. Payne	S. Parsons
W. Keller	F. Langley

Report by: Peter F. E. Marapodi

Purpose of Trip: To observe in detail the complete fabrication of the Apple Tube with respect to chemical processing techniques and to determine the cause and remedy for aluminum blistering.

Note: This report to be attached to Revision #4, dated November 30, 1954. All information contained in this report supercedes its counterpart in Revision #4.

1. Phosphor Slurry Formulation

The green, red and blue slurries are to be compounded according to Revision #4 schedule and rolled for seventy-two (72) hours before use. (This includes the solox and sensitizer in the formulation.)

2. Double Dichromating

A 2% solution of ammonium dichromate in de-ionized water is used for this process. Filter through a #150 stainless steel mesh and store in a brown bottle. Solutions are to be formulated for each day's use only. Only the green and blue stripes need be dichromated according to the following schedule:

A. "Fixing"the green stripe

1. Coat the dried screen on the face of the bulb with dichromate solution.
2. Dry for 15 - 20 minutes.
3. Use green master in exposure machine.
4. Expose for 5 minutes at F 11.
5. Develop for one (1) minute.
6. Air dry bulb before application of P.V.A., etc. for blue stripe.

B. "Fixing" the blue stripe

1. Same as 2A(1) above.
2. Same as 2A(2) above.
3. Use blue master in exposure machine.
4. Same as 2A(4) above.
5. Same as 2A(5) above.
6. Air dry bulb before application of P.V.A., etc. for red stripe.

3. Developing Schedules

The water stream should exit from the nozzle on the developer machine at an elevation of 25 degrees from the horizontal.

The developing schedules are:

a. Green stripe - develop for 1.0 minute
b. Blue stripe - develop for 2.5 minutes
c. Red stripe - develop for 2.5 minutes
d. MgO stripe - develop for 2.0 minutes

4. Kasil Screen Coating

Kasilize twice, according to schedule F, page 7, Revision #4 dated November 30, 1954, but eliminate the second bake and air dry instead. Decant solution so that pour off time ranges between 10 - 12 minutes.

5. Filming

a. 7,400 mls de-ion water
b. 520 mls Kasil #22 (11%)
c. Rm. temperature 70 - 73°F
d. Water temperature 18 - 21°C
e. Let cushion water stand for 45 minutes
f. Dispense 0.7 ±0.05 ml front lacquer #76 using a pressurized system. Tip of dispenser should be no higher than 0.5 inch above the water surface.
g. Air dry for 9.0 minutes
h. 10 - 12 minute pour-off cycle
i. Remove bulb and place face up in racks to drain for 30 minutes before air drying
j. Dry for 45 minutes using room temperature air

It is imperative that the exact volume of front lacquer be dispensed and procedures followed as outlined above.

After complete drying, the film at inspection should be colorless or possessing a light brown tinge. Blue, purple, or blue-purple tinges in the film will subsequently produce blistering in these areas after the bulb has been aluminized and back-lacquered.

Note: After formulation and filtering front lacquer #76, it should age one week before use. Viscosity measurements must be taken after aging with each new batch compounded and daily thereafter with use. A Zahn #4 cup should be used and specification limits should range between 26 to 34 seconds for viscosity.

Front lacquer #76 is compounded with 125 - 175" nitrocellulose. However, Lansdale is now requesting, and receiving, some 145 second nitrocellulose from the Hercules Powder Company as a means to limit the viscosity range and hold to tighter specifications.

6. Back-Lacquering

a. Bulb temperature must not exceed 78°F

6. Back-Lacquering (Cont'd)

b. Hold bulb at an angle of approximately 75°
c. Pour 100mls #520 or #522 lacquer down on side of the envelope onto the screen
d. Coat the panel of the bulb along the long axis with minimum amount of back-lacquer touching the screen
e. Tilt bulb and coat one of the short panels
f. Reverse tilt and coat the other short panel always advancing the back-lacquer film along the panel of the bulb and each time taking care not to get too much lacquer on the screen
g. Tilt bulb so that back-lacquer is now along the long panel of the bulb recently wetted in step 6(d) above.
h. Tilt the bulb SLOWLY back and forth along the long axis and coat the screen with lacquer, advancing the film across and down the face of the screen while doing so.
i. Wet the other long panel of the bulb taking precaution not to allow the back-lacquer to flow back onto the screen
j. Drain for 3 minutes with the face of the bulb in a vertical position
k. Rotate bulb 90°, face horizontal and up, drain for 3 minutes
l. Air dry with room temperature air, 10 lbs/sq. in., for two (2) hours.

Note: Back-lacquer solution can be used immediately after compounding and filtering and need not be aged.

7. MgO Application Techniques

a. P.V.A. must be dried for the same period of time as that used for the green stripe.
b. Use MgO master in machine
c. Exposure time for MgO the same as for the green stripe
d. Coat bulb with MgO, drain and dry for 45 minutes (room temperature air)
e. Develop for 2 minutes
f. Dry with room temperature air for one (1) hour

8. External Silver Paint

This need not be baked prior to having bulb processed further.

9. Lansdale Lehr Schedule - Monochrome and Color

a. Full cycle of 3 hours
b. Belt speed - 7 inches/minute
c. Max. glass temperature (at face) 426°C
d. Heating rate 7.1°C per min.
e. Cooling rate 3.4°C per min.
f. 44 minute soak above 400°C
g. 15 minute soak above 425°C

10. Removal of Excess Aluminum

Use a 1% solution of sodium hydroxide pellets in de-ionized water only.

11. Electrical Degree Range

Irrespective of masters used, ranges are:

a. Line width 20 electrical degrees

b. Spacing 15 electrical degrees

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CATHODE-RAY TUBE SUB-DEPARTMENT

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