

TRIP REPORT

PLANT VISITED - Thomas Electronics, Inc.
Passaic, New Jersey

DATE - May 14, 1953

PERSONS MAKING VISIT - W. L. Jones
C. E. Buchwald
R. W. Bryant

RECEIVED

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C. R. TUBE ENGINEERING - 1

PERSONS CONTACTED - Nick Broderick, Chief Engineer

FACTORY, PERSONNEL and OUTPUT

The plant was located in parts of several old buildings and on at least four floors. No information was obtained on the total area and we were given such a disjointed tour that it was not possible to estimate the area.

A figure of 2500 tubes per day was given as their production, but this is probably high (more nearly 1,600 to 1,800). Seventy percent of the production was 21" with the remainder 17". A few 24" and 27" were being made. Earlier in the year they had made a few 14". At the present time they are operating on a 5 day-2 shift basis with only a skeleton crew on the third shift. When operating 6 days, they only work 2 shifts. Direct workers totaled 450 people.

The factory is split into two operating units, one covering mounting, screening and rework, the second covering all other operations. Engineering included 8 men assigned to design and shrinkage and 4 to screening operations. Most of the engineers were formerly with DuMont.

They were in the process of rearranging some of the equipment. New transfer and aging conveyors were being installed and additional floor area, which we did not see, was being equipped. An additional exhaust unit together with supporting facilities was being added.

MOUNTING

About 70% of the guns were electrostatics and 30% electromagnetics. They made their own stems using the pre-stress technique. Both Kemet and King getters were being used; their preference, however, was Kemet. The electrostatic guns appeared to be a modified DuMont using ceramic rods on the lower portion and multi-form beads on the upper structure which were pinned by hand. They use both Superior and RCA cathodes and make their own emission mix using RCA triple carbonates.

WATER

Process water was given a pre-treatment and filtered through charcoal and sandbeds before being deionized in Ilco units. These facilities were being expanded.

BULB WASHING

The facilities consisted of two double concentric ring rotary bulb washers of their own design. Only one was in operation as the other was being re-installed in a new area. The units operated on a 23 second index giving two washes with ammonium bifluoride and straight deionized water rinses.

SCREENING

All screening work was carried out on tilt tables. It is estimated that they had a total of 120 positions. The units were of a double sided construction so that while one set was settling, the other was being dried.

No specific information was obtained on the solutions other than that kasil #1 and barium acetate were being used with 8 to 8.5 grams of Du Pont-Patterson phosphors for the 21" tube. Temperatures were stated as "cold". Plans were underway to install a precipitron to clean the air for the screening room. The overall bulb preparation losses were estimated by Broderick to amount to 15 to 20%.

ALUMINIZING

Thomas does not plan to do aluminizing except as the market forces them into it. They have a single position aluminizer and have set aside one 4 position tilt table for experimental work. They are trying to develop schedules on bakeout, exhaust, etc., as their life to-date has been less than 200 hours with gas being the apparent cause for failure.

INSIDE PAINT AND BAKE

We were not permitted to see the inside painting operations as Broderick claimed that it was a "secret" process. Observations from a distance, however, indicated that it was some type of flow coat process. Bulbs were loaded into a single position station face down, being supported by a vacuum chuck. The bulb rotated at a moderately fast rate so it appeared that centrifugal force played a part in the process. The operator sat down to carry out the work. As we had to go by the inside paint operation, we did not see the bulb baking operations. We were told that they did not use air flush, however.

GUN SEAL

We were not shown the gun seal-in operations as the sealers were "too close to inside paint". It appeared that they had a 16 head Kahle machine (17" every head or 21" every other head) and a newer large diameter Kahle with clearance for 27" on every head. Index times could not be obtained. Stems were preheated before seal-in. They are using nickel leads but are in the process of experimenting with nickel plated iron. As estimate of gun seal through pack, losses of 20% was given.

EXHAUST

Their facilities were 3 machines of their own design similar to the DPL construction with electric ovens of the Steiner - Ives type, operating on a continuous index with manual tip-off. Two of the units had split ovens; that is, two separate bake ovens with both ends open. These two machines were accordingly loaded from both ends. The third machine had a continuous oven and was loaded and unloaded from one end. The first two units had 45 buggies in each oven. The output was 27 tubes per hour from each side for 21" or a total of 54 per hour per machine. One unit could clear 24" on every other head. The second could handle 27" on every other head. The third machine had an output of 36 per hour for 24" and 18 per hour for 27".

The temperature rise was stated as 9° per minute. The tubes were held above 300°C for 20 minutes with a peak temperature between 390° and 400°C. The exit temperature was stated as 160°C. Observations of the regulators for the various oven sections showed all of them to be set at less than 385°C, which does not agree with their statement concerning peak temperatures. Only one RF position per machine was seen. Getters were flashed previous to tip-off. No cathode current was drawn during exhaust.

Although they stated their exit temperature was 160°C, Broderick stated that they sometimes ran two weeks without an implosion. Apparently we visited the plant during an unusual period inasmuch as we heard four implosions during our visit. We passed by one of the inlines approximately one hour after we heard the implosions and the machine was still not back into operation and the maintenance men were busy removing broken glass from the tracks and buggies.

They are planning an additional inline exhaust for 27", probably similar to their present large loop machine. They had obtained a few cans from Corning and had made a trial run. However, they were not enthusiastic over the results.

TUBE FINISHING

Tubes were placed face down on a conveyor belt and base bake accomplished with calrod heating strips along the belt. Aging and sparking were performed on an overhead conveyor. No specific information was obtained concerning the schedule except that it was 45 minutes to 1½ hours long with the last portion at a heater voltage of 6.3.

We were not shown their test set-up but supposedly the units are a carrousel type. In addition, they have 4 upright sets. We did not see their outside painting set-up. It is supposedly a 4 position unit.

They hold tubes two hours between outside paint and pack. A sample of the tubes are checked and if necessary all of the tubes are retested using the upright sets.

QUALITY PLAN

Five tubes per hour are checked by Quality. However, it was not apparent what action resulted if an unsatisfactory product was found. We were shown the life test room which contained 28 or 30 positions. At that time tests were shut down. Broderick said it represented about half of their positions. Six of the position could handle 27", eight 21" and the remainder smaller.

MISCELLANEOUS

Thomas ventured briefly into the receiving tube business last year but got out of it hurriedly. Considering the "shoe string" nature of their picture tube operations, their action in dropping receiving tubes is easily understood.

Apparently they are only at the thinking stage as far as color is concerned.

It was surprising to find that there was no union at their plant in spite of the fact that it was located in a highly industrialized area.

When asked about metal tubes, they admitted that they had made several hundred 24" round from which they obtained very poor life. As a result all were scrapped.

They use 80% Corning bulbs, 20% ASP.

Mr. Broderick was the only person contacted. He was reluctant to give information. Our tour of the plant was sketchy and we were not shown the complete shop. Due to their plant layout it was very difficult to estimate actual capacities. We were not shown gun sealing, stem making, inside paint, screen bake, aging, test, outside paint and bulb salvage.

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C. E. Buchwald
W. L. Jones, Jr.
August 18, 1953

cc: CE Buchwald
RW Bryant - BTP
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