Distribution

VC Campbell-#6
DR Coffman-#6
WJ Harber-#6
WL Jones-#6
EA Kafka-#6 (2)
JM Lang-#6
CL Mabee-#6
LC Maier-#5
RA Norman-#6
DW Pugsley-#5
PE Sullivan-#6
EA Whitemore (2)

STRICTLY PRIVATE

Electronics Park
Syracuse, New York
October 3, 1956

Trip Report

Kimble Glass Co.

Date: September 27, 28

Object: Study of bulb manufacturing methods.

Kimble Personnel:
P. Gilmore - Manufacturing
R. Ross - "
G. Zimmerman - Engineering
L. Pierzchala - "
P. Molloy - "
J. Coleman - "
J. Ferguson - "
R. Ritter - Sales

G. E. Personnel:
V. C. Campbell
D. W. Pugsley
W. F. Hopkins

The first day was spent at Kimble's bulb plant in Columbus, Ohio. The plant is relatively new and is combined with a recently built storage warehouse. The warehouse covers 3-4 city blocks in length and is estimated at 400,000 sq. feet area. Actually much of the building had been planned for color bulb production. The value of manufacturing and warehousing facilities was said to be $12 million.

Mold Shop

The operating force of this section comprises 30 personnel. The area was quite large indicating a very active section capable of extensive mold repair services. We were informed that the average mold life is 8-11 hours. A complete set of molds and plungers for each tube type comprises 54 molds and 8 plungers. The direct labor and material cost per mold and/or plunger was given as $400. The following schedule is used on mold reworking:

1. Wet sand blast

2. Electrolytically strip chrome
3. Repair and polish
4. Electrolytic chrome plate
5. Polish
6. Preheat before placement on equipment.

Batch House

This section comprised the most modern mixing methods and equipment. It was a very clean and orderly area. Extreme effort is being made to keep the batch cullet free from contaminant metals. They are searching for improved methods beyond the normal magnetic separator technique.

Glass Melting Tanks

Two large tanks provide 350 tons daily of lead free glass. Also on hand are a 40 ton and 2-20 ton electric melting tanks. These are utilized for standby or flexibility reasons and possibly indicate a trend toward electric melting techniques. The large tanks are conventional, regenerative type melting tanks.

Panel Pressing

We were informed that these presses were obtained from the Lynch Co. and the feeders were obtained from Hartford-Empire Glass Co. The rates of production were indicated to range between 360/hr./press for 14" size to 300/hr./press for 21" - 90° sizes. The yield is estimated at 60% with blisters the predominant problem. The presses are 11 position and operate on a double index to allow adequate panel cooling time. The shift production rates were indicated to be just slightly less than 5000 units.

Funnel Spinning

These units were 6 heads in size. The replacement rate on these heads was said to be approximately every four days. The equipment utilizes four burn-off units to remove the neck cullet. Three or four personnel are required to man each spinner unit.

Button and Neck Sealing

Button sealing is done on automatic, gas-fired sealing equipment. The equipment is 8 head and operates at an estimated rate of 10/minute. All neck sealing is done on horizontal glass lathes. The neck sealing department totaled 25 lathes and operated at a rate of approximately 20/lathe/hour. Kimble feels that they obtain a better splice using lathe techniques rather than automatic devices. This situation is under review, however.

Panel-Funnel Sealing

This department has 29 glass sealing lathes complement. The rate was indicated to be 20-22/hour on 21" sizes. They utilize gas-oxygen fires and 60 cycle electric sealing. Kimble appeared to have more sealing potential than was noted on Corning lathes, although no data are available to support this.

The parts are preheated to 400°F prior to sealing. 440V-AC is used on the primary input which dropped to 125V on sealing. A total of 75-90 amps sealing current is obtained (measured in the primary of the power transformer). Thus, approximately 10KW is obtained in the input transformer. Surface Combustion Co. lehrs are used for annealing purposes.

Face Polishing

As in Corning, this department is large due to face quality requirements. Buffing is required on 50-100% of all panel ware produced. All panels receive a polishing operation on automatic equipment. Large air inflated, rubber rollers with felt coverings utilizing selenium oxide slurry furnish the polishing action. The department utilizes two pieces of polishing equipment and operates on a 3 shift basis with approximately 50 personnel.

General

The plant direct labor comprises 1600 personnel. The productive capacity is rated at 5-7 million bulbs/year. Kimble was much more receptive to inquiries than noted at Corning Glass Works. The only subjects which they did not desire to discuss were bulb thermal shock test and engineering facilities.

The second day was spent in Toledo, Ohio at Owens-Illinois' Technical Center. There, has been brought together all the technical laboratories of Owens-Illinois Glass Co. Each division has centralized its technical sections of engineering and research. The building comprises glass technology, chemical, physics, furnace engineering and other associated laboratories. Also included is a glass making pilot shop which is currently working on lightweight containers such as jars and one gallon jugs. Such operations as glass density determination, softening point, expansion, electrical conductivity measurements, etc. are daily tasks. The total effect of this engineering concentration is quite impressive.

W. F. Hopkins
Mono. Picture Tube Prod. Engg.
CATHODE RAY TUBE DEPARTMENT

WFH:fle