

*File  
X-radiation*

*79  
10/10*

D. L. Crawford #8  
W. F. Hopkins #9  
E. F. Schilling #9

August 30, 1967

W. D. Rublack:

Please find attached Corning Glass Works' response to our verbal and written negotiations on the subject of x-radiation.

You will note that Corning finds the solution seemingly more complicated than Owens-Illinois whose verbal response I summarized for you last week. By the way, as you know, I have asked Owens for written confirmation of our understanding of their position.

Briefly Corning's sixth (6th) paragraph stating the x-radiation limits for certain 25" color tubes evaluated with 9024 face panel glass is encouraging; ie, 27.5 KV, 1.0 ma.-less than 0.1 mr/hr.  
30.0 KV, 1.0 ma.-less than 0.5 mr/hr.

Again Corning has more "boilerplate" on page one (1) and on the seventh (7) paragraph and seems there to avoid the real subject and definition of glass absorption characteristics and potentials.

Perhaps we could make 19" tubes from the special mapped 9024 panels and run measurements on those and other purchased color tubes for correlative measurements with Corning Glass.

Let me know if you want the special panels referred to in the attached.

D. R. Coffman

DRC:ddp  
Attachments

PURCHASING

CORNING GLASS WORKS 3 27 PM  
**CORNING** D.R. COFFMAN  
CORNING, NEW YORK

Television Products Division  
Television Bulb Sales Department  
Leon G. Pease, Manager

August 24, 1967

Mr. Donald R. Coffman  
Manager  
Purchasing & Traffic  
Cathode Ray Tube Operation  
General Electric Company  
Electronics Park  
Syracuse, New York 13201

Dear Mr. Coffman:

You asked by letters dated May 21, June 9, June 20 and June 27 about the technical feasibility of making a very substantial increase in the x-ray absorption of color bulbs. In your letter of June 20 you gave voltage and current data which we interpret as representing the operating characteristics of a G.E. color set. The absorption required in the bulb to limit x-radiation to 0.5 mR/hr. under these extreme conditions would require a major change in glass composition. The necessary change is equivalent to doubling the wall thickness of our present 9019-0129 bulbs. Or, maintaining present thicknesses, the absorption coefficients of both glasses would have to be doubled.

Our Research Laboratory has been carrying out a composition and technology study to determine the feasibility of glass with the required absorption. In the case of the funnel some compromise may be necessary in the strain point. The panel may require the addition of 2-3% lead oxide. We anticipate major changes in the forming characteristics and that large, factory-scale melting experiments will be required in order to evaluate all aspects of feasibility and cost. We expect to have preliminary information early in October.

There is considerable discussion in the industry about ways and means of limiting the anode voltage in television receivers. If there are to be design changes in G.E. receivers that will lead to lower voltages, this would greatly simplify the glass composition problem and we would appreciate it if you will keep us informed.

... continue

Mr. Donald R. Coffman

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August 24, 1967

With regard to our present product, our new 9024-9026 panel glass is more absorbing than 9019. It is intended for non-laminated tubes. X-radiation from the panel of bare faced tubes should be the same as, or less than, that from tubes with 9019 panels +PPG laminate.

Recent tests on 19" tubes with 9024-9026 panels were made using the standard JEDEC procedure. Attached is a anode voltage vs. beam current curve giving the voltage-current combinations that produce 0.5 mR/hr. This information applies to 9024-9026 panels only. The present 0129 funnel was designed to be adequate when tubes are operated at the published maximum electrical ratings of 27.5 KV and 0.75 ma. Thus, external shielding is required to make the x-radiation through the funnel equal to that through 9024-9026 panels.

To date 25" tubes with 9024-9026 panels have not been evaluated. It is anticipated, however, that x-radiation will not exceed the values given below:

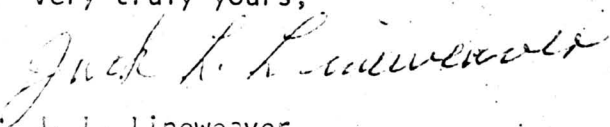
27.5 KV, 1.0 ma. - less than 0.1 mR/hr.  
30.0 KV, 1.0 ma. - " " 0.5 mR/hr.

The data given in this letter are based on measurements on tubes made by another manufacturer. It is cautioned that the amount of x-radiation generated inside the tube may vary from manufacturer to manufacture, depending upon processing techniques, design parameters and materials used. Examples are: mask material and thickness, hole size, mask coating, location of the getter deposit, and the phosphors used.

For the reasons just given it is desirable to have confirming measurements made at General Electric so as to bring in all factors involved in your design and construction. For this purpose we will be happy to provide special panels carefully mapped for face thickness to be made into tubes for evaluation. We would also be most anxious to have the opportunity to make coorelative measurements with your people on these tubes.

I hope that these comments satisfactorily answer your request in the aforementioned letters. I will look forward to hearing from you in this regard.

Very truly yours,

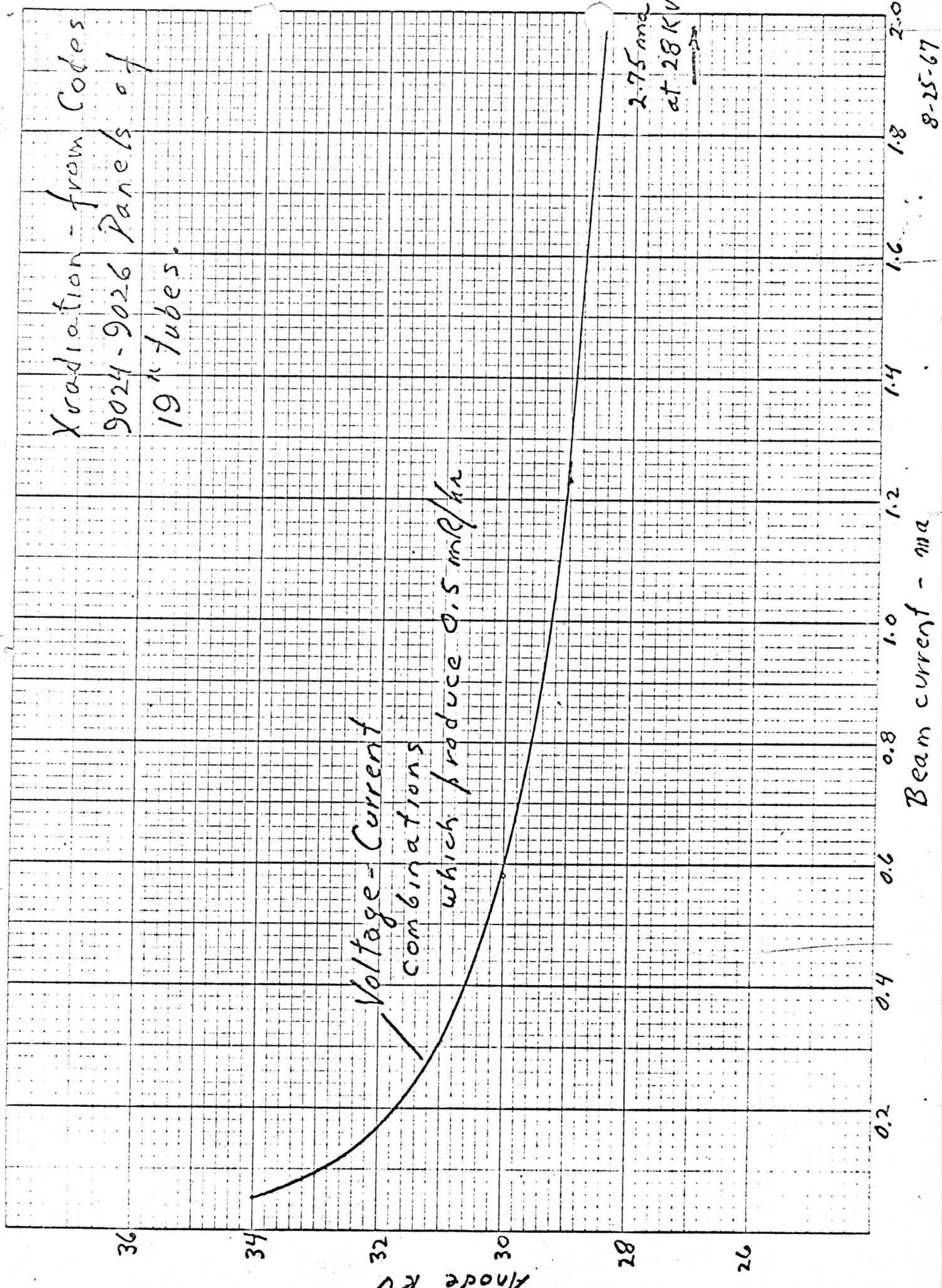
  
J. L. Lineweaver  
Manager of Engineering  
Television Bulb Sales Department

JLL:csj  
Enc.

Xradiation - from Codes  
9024-9026 Panels of  
19" tubes.

Voltage - Current  
combinations  
which produce 0.5 mR/hr

2.75 ma  
at 28 KV



Beam current - ma

8-25-67