

SUBJECT CHECKING FLUORESCENT SCREENS  
For quality & Color (In Bulbs)

SUPERSEDED DATE 9/3/43

Procedure Standardized: Checking quality and color of fluorescent screens in cathode-ray tube bulbs after application of screen material and after application of black conductive coating. \*\* (See S.N. 25-9-2, 2A, etc. for screen rejection limits)

1. EQUIPMENT

- a. 115V A.C. Tesla coil delivering a spark at least 1/2" long.
- b. Screen color checking device. Model #731 DD. See Stdzg. Not. 23-4-22.
- c. Exhaust Equipment - Kinney compound vacuum pump, pinch clamp and exhaust manifold. One end of each manifold must be equipped with an inlet for admitting air thru a 1/4" stopcock and an alundum disc filter, the inlet tube on the filter being drawn down to such a size (Size will vary with installation.) that a minimum time will be required to refill bulbs with air after they have been evacuated. This is to prevent damage to screen by intrushing air. A bulb holder supports the bulbs and prevents bulb necks from being drawn down over expansion stoppers inside necks, the exhaust manifold being fastened to stand which supports bulb holder. The bulb holder, Model #839-GG, is equipped with a set of supports to accommodate 3", 5", 7", 9" and 12" bulbs. Expansion rubbers and washers are also provided so the manifold outlets will accommodate 1-3/8" and 2" necks.

NOTE: The filters should be changed frequently enough to keep them clean and dry at all times, frequency depending upon air purity and humidity.

- d. Dark room, or hood with black curtains - for enclosing exhaust position and color checking device.

2. PROCEDURE

a. Place bulbs into holders above manifold and connect expansion rubbers to the inside of bulb necks. If all manifold outlets are not used it will be necessary to close the unused outlets by means of the pinch clamps at each outlet

b. Close inlet stopcock, open pinch clamp to pump and exhaust bulbs until they are sufficiently evacuated (to approximately 30 microns) as indicated by complete screen fluorescence upon bring live lead of Tesla coil against wall of bulb just below screen.

PRECAUTION: Do not let live lead touch wall at any place directly opposite screen, because concentration of bombardment close to electrode will change screen color. Also do not touch with hand any of area opposite screen while bombardment is going on as this will change screen color.

Important: Do not check bulbs while still hot after bakeout.



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- c. Darken room or booth in which test is to be made. Turn on lamp of color checking device. Bring live coil lead in contact with bulb wall just below screen. The screen should fluoresce strongly across diameter in line with live lead.
- d. Inspect for screen defects. - Defects commonly encountered in all types of screens are:

Non-uniform screens (patches, water lines, siphon marks, dark areas)  
 Spots (black, bright, green spots, holes, and seeds).  
 Discoloration.

\*\*Reject all drying lines.

The limits for these defects are specified in the MSS for particular tube types and should be consulted frequently. Spot limits and useful screen diameters are provided on a transparent limit gauge to be used in checking screens. §See Footnote.

- e. In the case of P4 screens, compare screen color by eye against comparison checker (see S.N. 23-4-22) while screen is fluoresced or against 2 standard samples by sparking bulb under test and standard at the same time. If color is beyond limits of standard colors, reject the screen.

IMPORTANT: If in any case, during the operating week or over the week end, more than 72 hours elapse between application of P4 screens and sealing-in, such bulbs must be rechecked for screen color.

- f. When P1 and P4 screens are in production simultaneously, P1 screens should be checked 10% to prevent mixing-up screen types and to check quality specified above.
- g. Close pinch clamp on vacuum line ahead of manifold, open stopcock to admit air to manifold, and remove bulbs after the following specified times:

<u>Tube Type</u>	<u>Holding Time (Minutes)</u>
12D	2.0
7B	0.75
5F	1.00
5CP1-P4	1.50
3" types	0.75

§NOTE: The use of shrinkage defect symbols as listed in S.N. 25-1-3 has been discontinued, but is retained only as an optional means of classifying all screen defects according to location and degree.

ENGINEERING SECTION  
 STANDARDIZING