SUBJECT: TESTING CONCENTRATION OF PHOSPHOR SOLIDS IN SCREEN SETTLING SUSPENSIONS

SCHEDULE NO. 1

The method herein described consists simply of obtaining a known volume of fluorescent suspension material and determining the weight of its content of dry solids. The measured volume of the sample to be tested is taken directly from the dispenser, (see S.N. 34C-Z-623) as a usual control check, but the same method can be applied to any other sample of the material provided that the constituents are uniformly distributed by agitation before sampling. Sampling from the dispenser fulfills the latter conditions and has the advantage of giving the following complete information:

1. Accuracy of weighing of dry Z609A powder used for suspension.
2. Accuracy of dilution of suspension with distilled water.
3. Setting of dispenser timers and #2 valve.
4. Completeness of agitation in dispensing tank.

1. EQUIPMENT:
   a. Graduated cylinders - 100 ml. and 250 ml.
   b. One liter, regular wash bottle of distilled water.
   c. 250 cc. Pyrex beaker.
   d. Selas Filtering Crucible - Porous bottom, Medium - 40 ml.
   e. One liter suction flask.
   f. Rubber cup crucible holder.
   g. Crucible tongs.
   h. Drying Oven - Thermostatically controlled at 120°C.
   i. Torsion balance with accuracy to 0.1 mg.
   j. Suction line.
   k. Dessicator for cooling crucible.

2. PROCEDURE:

   a. The suspension sample contained in the graduated cylinder is to be transferred to the 250 cc. beaker for ease of pouring. Use the wash bottle distilled water to rinse all the phosphor from cylinder to beaker.
   b. Weigh the clean crucible to the nearest milligram after drying in the oven at 120°C. for at least 15 minutes.
   c. The filter is prepared by assembling the crucible, rubber cup, and flask firmly. Next connect the tip of the flask to the suction line with heavy wall rubber tubing.
   d. Turn on suction to create a vacuum within the flask.
   e. Agitate the sample in the beaker (avoid any spilling) and pour into crucible. The filtrate passes through rather rapidly.
   f. Finally, rinse all phosphor from the beaker into the crucible and continue suction until all liquid passes through filter.
   g. Turn off suction and remove crucible from cup.
   h. Transfer the crucible to the drying oven and hold at 120°C. for at least one-half hour.
   i. Using the tongs, place the crucible in the dessicator to cool for at least 15 minutes.
   j. Weigh the crucible and dried phosphor to the nearest milligram on the same balance previously used.

(Cont'd on page 1a)

2. PROCEDURE: (Cont'd)

The concentration of phosphor in the original suspension is then determined by calculation:

$$\text{Concentration (mg./cc.)} = \frac{\text{(weight crucible + dry powder)} - \text{(weight crucible)}}{\text{cc. Suspension}}$$

Standard Concentrations:

For P4-02 phosphor is 12.8 mg./cc. or 50 grams of powder to 3900 cc. of suspension.

Note: After all determinations have been made by weighing or calculation, the used crucible is to be cleaned by copiously rinsing with warm tap water. If the phosphor is difficult to remove, a dilute solution of hydrochloric acid may be used. Finally, rinse thoroughly with distilled water.

SCHEDULE NO. 2

The following process specifications describe an ALTERNATE METHOD which may be used for faster testing of the phosphor solids concentration. The method herein described consists simply of obtaining a known volume of fluorescent suspension material from the battery jars and determining concentration without going through a time consuming procedure. This method is also applicable to other more dilute suspensions, providing the suspension is well agitated, by use of larger sampling bottles. The average time for this test is eight minutes.

1. EQUIPMENT:
   a. Centrifuge, International Equipment Co. Size #2 (1)
   b. Tachometer, I.E.C. Cat. #748 (1)
   c. Brass Spider, I.E.C. #239 (1)
   d. Cup Holders, I.E.C. #239 (2)
   e. Graduated Glass Centrifuge Cup, 100 cc. (2)
   f. Glass Funnel, 4" (1)
   g. Stainless Steel Sampling Bottle and Rod, 39.3 cc. (1)
   h. Wash Bottle, 1 liter (1)
   i. Record Book (1)

2. PROCEDURE:

   a. Using the stainless steel sampling bottle and rod draw off a sample of suspension from either battery jar. Cap the bottle.
   b. Rinse outside of bottle and cap.
   c. Place glass funnel into graduated glass centrifuge cup and pour sample into the cup using wash bottle to remove all adhering sulphide.
   d. Repeat steps a,b, and c using another cup whose weight is within ±1.5 g. of the first cup.
   e. Add water from the wash bottle to the cup holding the least amount of suspension until both cups hold the same volume.
   f. Place cups in the holders which are placed oppositely in the spider which in turn is mounted on the centrifuge shaft. Run for 5 minutes at 1700 RPM using the tachometer to read the revolutions as per the directions mounted on the centrifuge. Keep the centrifuge cover clamp down from start to finish.
   g. Carefully remove cups and take readings. Tap cup gently to level phosphor surface if necessary.
   h. Record readings in record book.
   i. If readings are not within the limits of*0.58 ml -*0.65 ml, call the foreman.

   Note: Tests shall be run on every full battery jar before any suspension is removed.
   Centrifuge cover must be clamped down when machine is in use.
   Keep equipment clean.

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