SUBJECT: CEMENTING MOUNT PARTS TOGETHER
Process Specifications

Procedure for fastening metal parts such as grids, plates and supports to ceramic rods in mount assemblies for cathode ray tubes is herein standardized.

SCHEDULE NO. 1
(For C21 Sauereisen Cement)

1. EQUIPMENT

a. Jigs - Jig and spacers for holding parts such as deflection plates and ceramic rods in alignment and jig called "hand lathe" for holding such an assembly in alignment with a partial mount assembly.

b. Lathe support.

c. Hot air drying apparatus - consisting of a 10-position circular base, 2 stationary concentric air tubes each having a heated air section for the first 6 positions and a cool air section for the remaining 3 positions (position 10 is for loading and unloading). Outlets are spaced similarly to positions on the revolving base. Outlets are made of short lengths of brass tubing vertically mounted, each tube having a row of 13 holes 3" long. Cooling outlets on the outside tube are arranged in pairs (one to cool the hand lathe and the other to cool the mount). Outlets in each pair are about 2" apart. Opposing outlets are about 3-1/4" apart. Air for the heated air sections is obtained by heating incoming air over a straight-line gas-air burner about 2 ft. long located above the air tubes.

** d. "Hand lathe" drying holder.

* e. Electric oven - such as Edison Hotpoint 220v - 6000w oven with thermostat switch control.

* f. Pint size zinc jar with flexible tubing and nozzle for extrusion of cement on mount. Air pressure, regulated by foot pedal, discharges cement. A water reservoir is used to prevent nozzle from clogging when not in use.

g. Graduates - 250 cc capacity and 10-15 cc capacity.

* h. Viscosimeter - Consisting of 1-1/2" lucite tube 6" long to which a tapered part has been cemented 1" long and 12" dia. on the small end. A scribed line is located 5-1/16" from large end of device.

** i. Jars - 1 gallon capacity.

2. MATERIALS

---- Parts and mount assemblies on which the use of adhesive cement is specified.

C21 Sauereisen Cement. The thinner to be used for this cement is also specified in S.N. 33-C-21.

3. PROCEDURE FOR MIXING SAUEREISEN CEMENT

a. One quart cans of cement when received from Material Control should be rolled for at least 72 hours before being opened to mix thinner and cement thoroughly.

b. Pour 3 cans of cement into gallon bottle along with about 200 cc of additional thinner. This will vary from time to time depending upon the characteristics of cement.

c. Clean mouth outside of bottle and cap thoroughly before screwing top in place, otherwise it will be impossible to remove cap.

d. Roll bottle for at least 48 hours to insure uniform mixing.

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* CHANGE
** ADDITION
*** DELETION

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3. PROCEDURE FOR MIXING SAUEREISEN CEMENT

e. Check viscosity by filling the viscosimeter to the top. Using a stop watch record drainage time until level of cement reaches the scribed line on the instrument. Best factory results are insured with a drainage time of 11 seconds ±1 second. If the drainage time is longer than the prescribed time, add thinner as specified in the Cement Viscosity Table. Before rechecking viscosity, roll cement again for at least 24 hours to insure uniform mixing. If viscosity is still high, repeat. If viscosity is OK, tag bottle with date and place on rollers until ready to use.

Note: A viscosimeter is a device for measuring the viscosity (molecular friction) or flow properties of a liquid. Cleanliness of material and instruments affect the viscosity of a liquid considerable. It is therefore of the utmost importance that the cement is uniformly mixed and the viscosimeter is clean and dry before using. The viscosimeter should be thoroughly washed with warm tap water immediately after use and dried completely.

4. APPLICATION OF CEMENT

a. Load specified deflection plates and aperture discs, latter properly spaced, and ceramic rods (or other parts) into jig designed for proper spacing and alignment of parts.

b. Place "hand lathe" into holder and into this jig clamp a partial mount assembly and also the jig containing parts such as deflection plates and ceramic rods to hold these parts in correct alignment with mount assembly. Unless cementing of some parts must be started or can be done better while hand lathe is still in vise, the jig should be removed from the vise and be held by hand during cementing operation.

* c. Removing cement extrusion nozzle from water well, wipe off water and excess cement. Adjust line pressure (15 lbs. to 25 lbs.) to obtain good regulation of flow with foot air pedal. Apply carefully to joints. Cement should be applied halfway around and on both sides of a joint but the coated area should be kept as small as possible. Except where there are two or more adjacent and parallel RA parts the cement should be extended from the top of one part to the bottom of the next. Do not bridge cement between any deflection plate support and adjacent RA part. The operator should be very careful not to splash or squirt cement where it is not needed and no more cement than necessary should be used to cover a joint. CAUTION: Surplus cement results in difficult drying, in less strength, electrical defects due to changes, and in possibility of loose particles (in finished tube) which may damage the screen during transportation of tube.

It is better to neglect one small portion of a joint than to increase the amount of cement. It should also be borne in mind that cement should not be added onto a cement crusted area.

* d. After cement has been applied to all joints, stand jig ("hand lathe") upright in drying holder to air dry cement for about 3 minutes before placing in hot air dryer. This is necessary to prevent bubbles from forming.

* e. Place hand lathe in hot air dryer, having previously adjusted fire below heating tube and regulated flow of air (from 4 lb. low pressure air line) thru hot tube so that air at about 100°C will flow freely from outlets. Allow cemented assemblies to dry at least 24 minutes before removing jig from dryer.

* f. Again place hand lathe into lathe holder; release clamp on mount assembly and on parts-holding jig and then remove latter from assembly, after releasing clips which hold plates against plate mandrels.

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4. APPLICATION OF CEMENT (Cont'd)

* g. Remove assembly from hand lathe, and withdraw spacers and lower plate mandrel.

* h. Insert check mandrel into assembly making sure that it passes thru bottom aperture of 1st anode. Check position of plates from mandrel. Mandrel must be equidistant from each set of plates. Reject all assemblies where mandrel touches or lies very close to any plate. In case of doubt, when plates appear slightly off line, ask supervisor to pass on assembly. Occasionally check mandrel for straightness.

* i. Place cemented assemblies (never one on top of the other) into electric oven and heat at 160° to 195°C for a minimum of 3 hours unless otherwise specified.

** j. After assemblies have been mounted bake mounts at 180°C for 30 minutes, not more than 2 days before sealing.

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* CHANGE
** ADDITION
*** DELETION

CEMENT VISCOSITY ADJUSTMENT TABLE

Measure the drainage time. Note the figure in column B corresponding to this drainage time. Note the figure in column B corresponding to the desired drainage time. The amount of thinner to be added to obtain the desired drainage time is the difference between these two figures. Check the viscosity with the viscosimeter, and if correct, the cement is ready for factory use.

A Drain Time (Sec.)	B cc Thinner (to add)	A Drain Time (sec.)	B cc Thinner (to add)	A Drain Time (Sec.)	A cc Thinner (to add)
10.5	10	22	64	42	88
11	15	24	67	44	92
12	25	26	71	46	93
13	30	28	74	48	94
14	35	30	77	50	95
15	40	32	79	52	96
16	46	34	81	54	97
17	49	36	83	56	98
18	54	38	86	58	100
19	56	40	87	60	104
20	59				

The procedure described above for one half gallon cans of cement as received may be modified somewhat and used for approved production cans of cement which have become thicker (viscosity of cement has increased) during storage or use. In such a case, the can of cement should be rolled to uniform viscosity and the viscosity checked. The proper amount (obtained from table) of thinner necessary to bring the viscosity to the correct value is added, the cement and thinner well mixed, and the viscosity of the cement checked. If found to be all right, the cement is ready for production purposes.

SCHEDULE NO. 2
(For S156 Silicate Cement)

1. MATERIALS

   a. Parts and mount assemblies on which the use of adhesive cement is specified.
   b. S156 Silicate Cement.

2. PROCEDURE

   a. Be sure all water is removed from cementing tool.
   b. Use only enough cement to hold parts in place. Do not bridge cement between parts.
   c. After applying cement, place cementing jig in a holder and allow cement to dry for 1-1/4 hours. Do not use air jets as they cause the surface to dry too rapidly.
   d. Bake at 160°-180°C. for at least 3 hours.
   e. Bake mounts at 350°C. for 45 minutes, not more than 2 days before sealing. Store mounts in heated cabinet.

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