



This specification covers the Factory process of applying a transparent, iridescent, and electrically conductive coating to glass bulbs for C73162 and C73373 Vidicons, and contains processing details on:

- I. Iridizing
- II. Inspection
- III. Cleaning & Storing of Nebulizers
- IV. Records and Precautions

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I. IRIDIZING

- 1. EQUIPMENT
 - a. Six position iridizing unit, Model No. 799BY, incorporating an electrically controlled oven for heating face plate and about 3" of adjacent part of bulb, a manually operated base (movable through oven) supporting the "V" fixtures for holding the bulbs and nebulizers, high pressure air filter and regulator and flow gauge, and an exhaust fan and duct for carrying off fumes.
 - b. DeVilbiss No. 40 Nebulizers which have had sealed to them 8" long, 3/4" diameter, #8 glass necks. The angle of the neck extension to the main axis of the nebulizer shall be approximately 30°.
 - c. Interval Timer.
 - d. Small glass funnel for filling nebulizers with the iridescent coating solution. The funnel stem must be long enough to extend down into the nebulizer bowl.

- 2. MATERIALS
 - I603 Iridescent Coating Solution.
 - Masked Bulb Assembly as specified.

- 3. PROCEDURE
 - a. The following schedule is for use with 1, 2 or 3 positions (not consecutive) of the 6 position oven.
 - 1. Turn on oven, set oven controller at 450°C, and allow approximately 15 minutes for oven to stabilize at this temperature.

Note: Temperature on face plate of bulb before turning air on through nebulizer should be 500°C-520°C.

 - 2. Remove cleaned nebulizer from heated cabinet (see Section III of this notice) and fill with iridescent coating solution by pouring through funnel. Fill to 1/16-1/8" below atomizing nozzle. Do not shake the solution during any of the handling operations. Filtering of the iridescent coating solution is necessary when the presence of any crystals or other particles are noticed (see Section IV).
 - 3. Mount filled nebulizer in the nebulizer "V" clamp holding fixture in position 1 and attach air hose.
 - 4. Mount a "reject" bulb over nebulizer, turn air on at 18 c.f.h. for one minute. Then turn off air and remove the "reject" bulb.

Note: This step of flushing the nebulizer is done only once after each filling of the nebulizer with the iridescent coating solution.

SCALE—

DIMENSIONS IN

UNLESS OTHERWISE SHOWN. DIMENSIONS SHOWN WITHOUT TOLERANCES ARE DESIGN CENTERS

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I. IRIDIZING (Cont'd)

3. PROCEDURE (Cont'd)

a. (Cont'd)

5. Remove masked bulb assembly which is to be iridized from heated cabinet, check face plate for dust or lint and other dirt particles, mount over nebulizer and in the bulb "V" clamp holding fixture being careful not to scrape nebulizer against masking compound on bulb.
6. Align bulb face plate concentric with open end of nebulizer and position bulb and nebulizer so that the spacing between inside of face plate and open end of nebulizer is 1/16-1/8".
Note: Too close a spacing will result in a heavier iridescent coating at the edge of the face plate while a light edge is caused by too great a spacing.
7. Move bulb directly into position 3 which is the iridizing position and preheat in this position for 5 minutes.
8. While above bulb is preheating and if more than one position is to be used for iridizing, repeat steps (2) through (6).
9. After the 5 minute preheat, slowly open air valve to give a flow of 18 c.f.h. through the nebulizer.
10. Observe the interference colors on the face plate of tube being iridized by means of the mirror mounted above the window in the oven top. The order of appearance of colors is as follows:

- 1st Yellow
- Red
- Violet
- Blue
- Green
- 2nd Yellow

Record iridizing time, lot of iridescent coating solution used, oven temperature & air flow (See Section IV).

Note: Time for above color changes to take place is at present 1-1/2 - 3 minutes.

11. Close air valve when second yellow appears and move tube into position 5 to cool.
12. As above bulb is moved into position 5, the bulb previously loaded in position 1 is moved into position 3, so proceed by repeating steps (7) through (12).
13. When the bulb in position 5 is moved into position 1, remove it from the unit and place in a tray to cool before inspecting according to Section II of this notice.
14. Another bulb may now be mounted in position 1 and the above procedure followed until all bulbs are iridized.

Note: After iridizing 10 bulbs with a nebulizer, replace this nebulizer with a clean one and proceed starting with step (2).

15. In shutting down the equipment after completing an iridizing run, shut off oven switch, exhaust fan switch, main high pressure air valve, remove dirty nebulizers and clean and store according to Section III of this notice.

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I. IRIDIZING (Cont'd)

3. PROCEDURE (Cont'd)

- b. The following schedule is for use with 4, 5 or 6 positions of the 6 position oven.
 - 1 - 6. Same as step (1) through (6) of 3a on previous pages.
 - 7. Move bulb into position 2 preheating in this position for 5 minutes for the first bulb only. Subsequent bulbs will be preheated in position 2 for the time necessary for step (10).
 - 8. As the above bulb is moved through the various positions of the oven mount additional nebulizers and bulbs in position 1 following steps (2) through (6) until all positions are loaded.
 - 9. After the 5 minute preheat in position 2 move the bulb into position 3 which is the iridizing position.
 - 10. Continue heating in position 3 for 3 minutes. Then slowly open air valve to give a flow of 18 c.f.h. through the nebulizer. Observe the interference colors on face plate of tube by means of the mirror mounted above the window in the oven top. The order of appearance of colors is as follows:

- 1st Yellow
- Red
- Violet
- Blue
- Green
- 2nd Yellow

Record iridizing time, lot of iridescent coating solution used, oven temperature & air flow (See Section IV).

Note: Time for above color changes to take place is at present 1-1/2 - 3 minutes.

- 11. Close air valve when second yellow appears and move tube into position 4.
- 12. Repeat steps 10 and 11 for each new bulb as it is moved into position 3.
- 13 - 15. Same as steps (13) through (15) of 3a on previous pages.

II. INSPECTION

1. EQUIPMENT

- a. Bulb inspection booth equipped with microscope lamp with variable focus lens and powered by rehostat controlled transformer.
- b. Bausch & Lomb inspection microscope with reticle calibrated in 0.001" divisions.
- c. Spencer Stereoscopic microscope (10X).
- d. Black china marker, soft cloth, quality area gauges and file.
- e. RCA volt-ohmyst equipped with a special probe for reaching inside of face plate on bulb.

SCALE—
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APPLICATION OF IRIDESCENT COATING

SUBJECT: Process Specifications

II. INSPECTION (Cont'd)

2. PROCEDURE:

- a. Check resistance of iridescent coating as follows:
 - 1. After iridizing allow bulb to reach room temperature. File off a small section of the target ring edge to remove oxide. Using a volt-ohmyst measure resistance by placing a special probe on iridescent coating at the center of face plate and touch the other meter lead to the clean edge of target ring. Record the resistance reading opposite bulb number in record book (See Section IV). If resistance is greater than 1000 ohms, reject bulb.

Caution: Care should be exercised when using probe so as not to scratch iridescent coating.

- b. Wash out masking compound from bulb according to schedule shown on iridized bulb assembly notice.
- c. Recheck and record resistance of iridescent coating as in (a) above. Reject bulb if resistance is greater than 1000 ohms.
- d. Inspect iridized face plate for defects as follows:
 - 1. Using a 10X microscope and both reflected and transmitted light, whichever shows up the defects best, circle with a marking crayon any scratches, smudge spots, haze, dirt spots, blisters, seeds and stones which might be out of the reject limits as shown below. Then with a Bausch & Lomb inspection microscope with reticle measure the size of the defects marked and reject if out of the following limits:

a. Quality areas:

Zone 1 - Circle concentric with center of face plate having a diameter of 0.410".

Zone 2 - Area between Zone 1 and a circle concentric with center of face plate having a diameter of .620".

b. Scratches: Max. width 0.001" - Max. total length of 1/4" in Zone 1 and 1/2" in Zone 2.

c. Haze, smudge, or cloudiness: None permitted.

* d. Inspect iridized face plate for defects as follows:

Schedule No. 1:

Dirt spots, seeds, stones, all inclusions or marks interfering with the transmission of light:

	Over .005"	.003-.005" (including .005")	.001"-.003" (not incl. .003")
Zone 1	None	None	Any number (minimum separation = 1/8")
Zone 2	None	3 (minimum separation 1/8")	Any number (minimum separation = 1/16")

Schedule No. 2:

Dirt spots, seeds, stones, all inclusions or marks interfering with the transmission of light.

	Over .003"	0.0023-0.003" (including .003")	0.001-0.0023 (not incl. .0023)
Zone 1	None	None	4 (minimum separation 1/8")
Zone 2	None	4 (minimum separation 1/8")	Any number (minimum separation 1/16")

Blemishes under .001" do not count unless the concentration causes a haze or smudge appearance.

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III. CLEANING AND STORING OF NEBULIZERS

- 1. EQUIPMENT
 - a. Sink with hot and cold tap water, and deionized water.
 - b. Heated cabinet.
 - c. Filtered high pressure air line.
 - d. 1000 ml Pyrex beaker.
- 2. MATERIALS
 - M15 Methanol
 - W60 Deionized water
 - Tap water
 - High pressure air
- 3. PROCEDURE
 - a. Rinse thoroughly with methanol.
 - b. Wash and rinse thoroughly with hot tap water.
 - c. Rinse with deionized water.
 - d. Rinse with methanol.
 - e. Blow dry with high pressure air (until all water and water vapor has disappeared).
 - f. Store in heated cabinet.

IV. RECORDS AND PRECAUTIONS

- I. PROCEDURE
 - a. Change nebulizer necks every 25-30 bulbs.
During iridizing some iridescent coating solution becomes baked on the portion of the nebulizer neck which extends into the oven and interferes with the proper action of the nebulizer generally causing spotted coatings. Therefore, after use of a nebulizer for 25-30 bulbs, cut off the 8" extension and seal on a new neck.
 - b. Clean glass air line filters once a month.
 - c. Use only fresh lot of iridescent coating solution. Iridescent coating solution deteriorates with age, and is therefore made up by the Lancaster C & P Lab in one-pint quantity only as needed by the using department. Replace a lot of iridescent solution every two months or when the level of the solution is within 1" of the bottom of the pint jar.
 - d. Filtering of the iridescent solution:
 - 1. A new lot of iridescent solution should be filtered before placing in production.
 - 2. Filter a lot of solution when the presence of any crystals or other particles are noticed.
 - e. List bulbs by number in a record book as iridized and record opposite each bulb number iridizing time, lot of iridescent coating solution used, oven temperature, air flow, resistance before and after washing of bulb, and disposition of bulb.

ENGINEERING SECTION
STANDARDIZING

SCALE—

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