



pH Reference Sub Assembly PN: 802754

Users **will not** deviate from this Procedure. If there are any discrepancies found within the procedure immediately notify your supervisor

Read the entire procedure before beginning

If any steps are unclear, DO NOT PROCEED.

Ask your supervisor for assistance

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Tools/Materials Required

- Wire Strippers (w/ 30 gauge wire strip capabilities.)
- Tin Solder 0.020" Dia.
- Ruler or tape measure (at least 14" in length).
- pH Reference Electrode Soldering Jig [235877].
- O-Ring Installation Tool
- Reagent Alcohol.
- O-Lube
- Kim wipes
- Reference Electrode Retainer [235740]
- Vacuum Fixture
- Potting Jig [235703]
- Q-Tip
- Foil Cup
- Epoxy [25061]
- 1ml syringe [311000]
- 5ml syringe [31093]
- Side Cutters
- Vise
- Roll Pin Guide Tool [235795]
- Soldering Iron
- Soldering Flux
- Heat Gun
- CAL housing [235788]

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1. Cut the blue 30 gauge wire [172761] to a 14" length.
2. Strip one end of the blue wire by approximately 0.125" and tin with .020" thick soldering wire.
3. Place the pH Reference Electrode [235367] on to the soldering jig. Make sure the drilled hole on the Reference Electrode is facing upward. Inspect the sealing surface for any scratches or cracks.
4. Run the blue 30 gauge wire through the brass tube of the jig while leaving the stripped end of the wire exposed.
5. Wipe the top face of the Reference Electrode with Reagent alcohol followed by placing a little flux into the hole and on the center circle of the Reference Electrode.
6. Stick the stripped end of the 30 gauge wire into the hole of Reference Electrode.
7. Solder the wire to the Reference Electrode. Be sure to not let any solder outside of the center circle. See Figure 2.
8. Wipe the face of the Reference Electrode with Reagent alcohol to remove any remaining flux.



Figure 1: Reference Electrode Jig

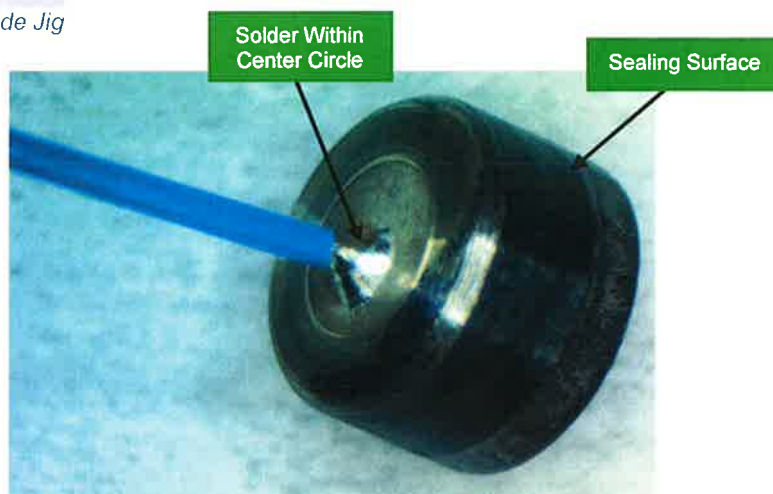


Figure 2: Soldered Reference Electrode.

9. Inspect O-Ring 311492 of any debris or defects. If any defects exist toss the O-Ring and replace. Otherwise clean the O-Ring with alcohol and then visually inspect it for any remaining fibers. Use tweezers to remove fibers. Note: Be careful not to let the tweezers scratch the O-Ring surface while doing so. Use this procedure of cleaning for all remaining O-Rings in this document.
10. Lube the O-Ring so that there is a slight sheen on its surface. The lube should be about the same size as the tip of the syringe and applied to your index finger. Put the O-Ring between your index finger and thumb and roll it around between these two fingers to apply the lube. Use this procedure of lubing the O-Ring for all remaining O-Rings in this document.

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11. Inspect the pH Ref Carrier [235577] bore of any debris. Use the air brush to clean out the bore.
12. Insert the O-Ring into the pH REF Carrier. See Figure Below.

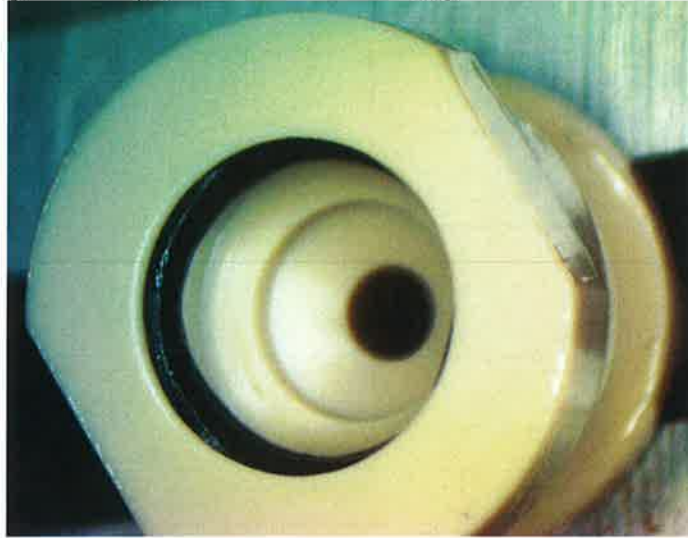


Figure 3: O-Ring Inserted In Ref Carrier

13. Inspect O-Ring 31976 and back up ring 311211 for debris and defects. Clean the O-Ring and back up ring with Reagent alcohol.
14. With O-Lube, lightly lube the O-Ring and back up ring.
15. Use the O-Ring installation tool to install the O-Rings on the Reference Carrier by sliding the O-Ring and back up ring over the narrow side of the tool to the thicker side of the tool. See Example Below.

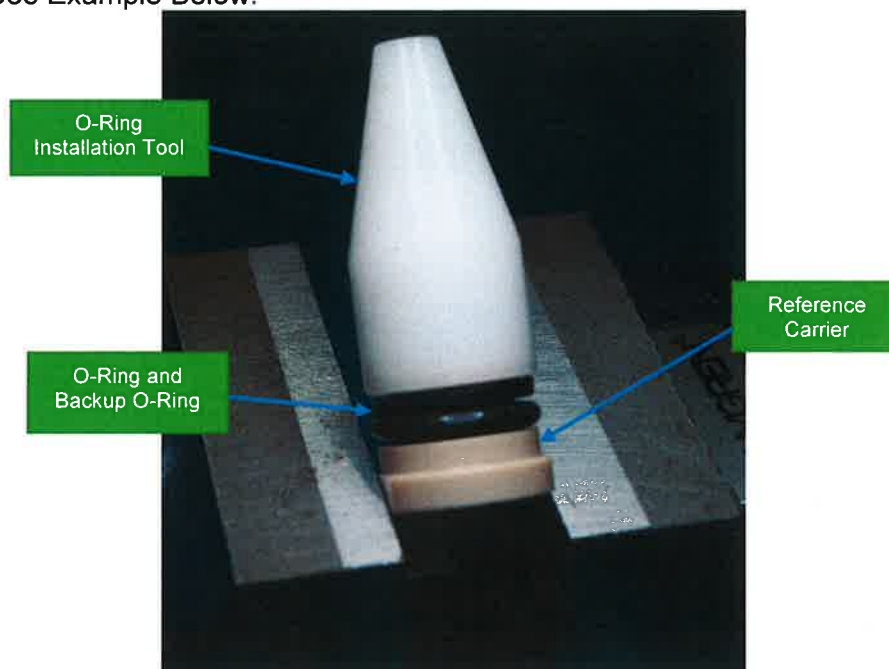


Figure 4: O-Ring Installation

16. Using a Kim wipe soaked in reagent alcohol, wipe down the blue wire to remove any lint on it.
17. Feed the blue wire through the Reference Carrier from the side with the larger hole.

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18. Carefully seat the Reference Electrode in the Reference Carrier.

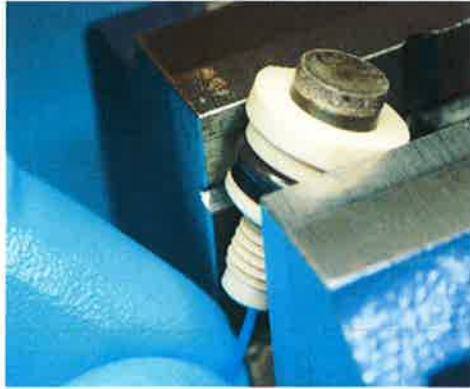


Figure 5: Seating the Reference Electrode

19. Lay the Reference Carrier face down on the table and gently press downward until the Reference Electrode slips through the O-Ring. You should feel it pop into place as the Reference Electrode is pushed through the O-Ring. Reference Electrode should protrude from the Reference Carrier by approximately 1/16".

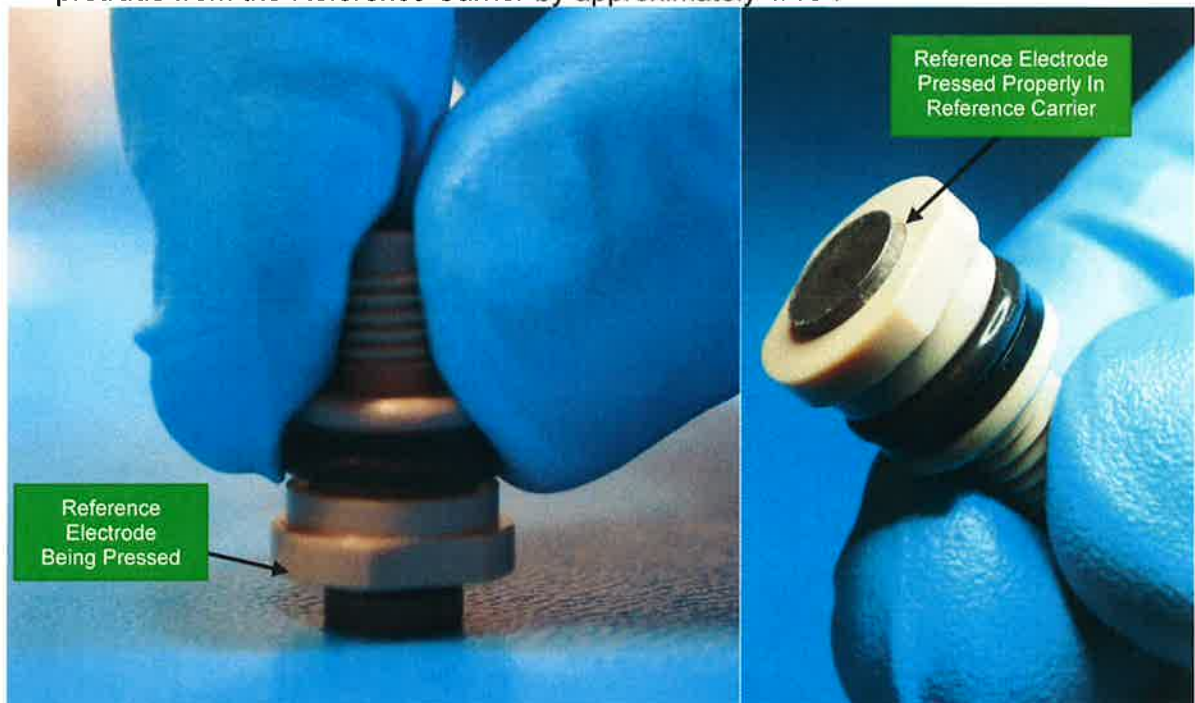


Figure 6: Pressing Reference Electrode into Reference Carrier

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20. Place the Reference Electrode Retainer over the Reference Carrier and compress the spring by pushing the Reference Carrier into the retainer. Once bottomed out, twist the Carrier 90 degrees to lock the Carrier in the Retainer.

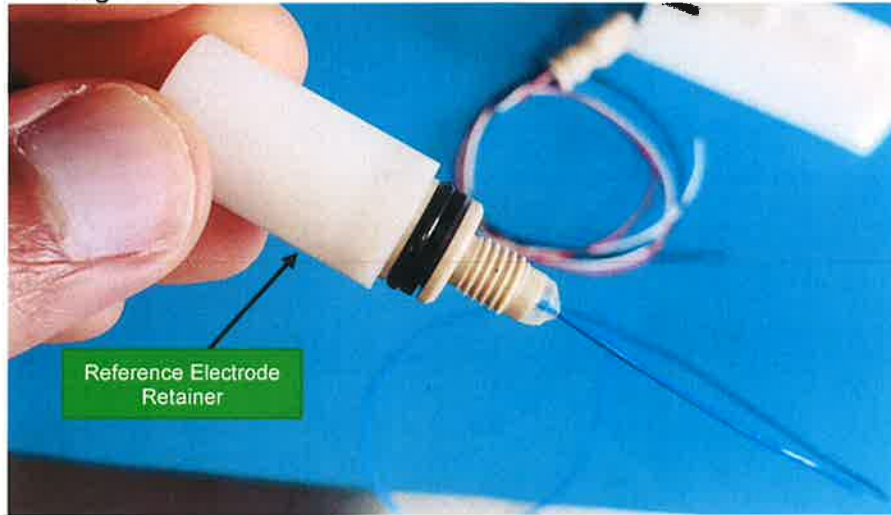


Figure 7: Reference Carrier in Retainer

21. Insert the threaded end of the Reference Carrier into vacuum test fixture.



Figure 8: Reference Carrier in Vacuum Fixture

22. Insert vacuum hose into the hose barb on the vacuum fixture.
23. Open the lines of the vacuum fixture that contain a reference carrier in them. Make sure all vacant lines are closed.
24. Turn the vacuum pump on by pressing on the vacuum pedal and let it pull vacuum for approximately a minute and a half.
25. Close the opened lines that contain the Reference Carriers then turn the Vacuum pump off. Disconnect the vacuum line.
26. Take note of the vacuum value for each Reference Carrier by writing it on the fixture with a sharpie. Leave overnight to check for pressure leaks.

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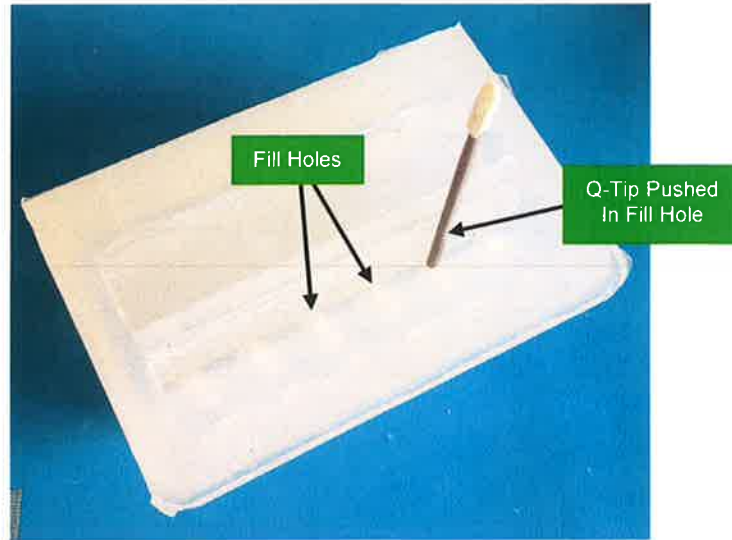
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27. Verify there is no remaining cured epoxy in the fill holes of the mold. If there is push it out with the back of a Q-tip. See Below.



28. Load Reference Carriers into the Potting Jig by first inserting the wire through the smallest hole that can be found on the sloped face of the mold. Pull the wire all way through. Push the Reference Carrier into the bored hole of the sloped face of the mold. Make sure the O-Ring is engaged. Place the wires into the slits of the Potting Jig to keep them taught. If 6 reference carriers are not used during the potting process plug all holes that are vacant with a Q-tip.

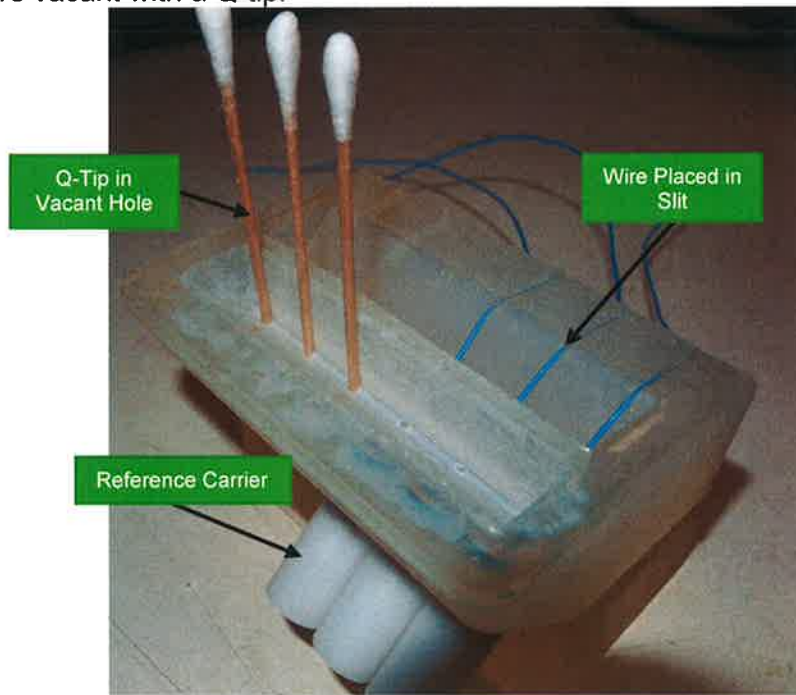


Figure 9: Reference Carrier in Potting Jig

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29. When all stations of the potting jig are filled with either a Q-tip or Reference Carrier, tape the Potting Jig as seen below to contain all epoxy.

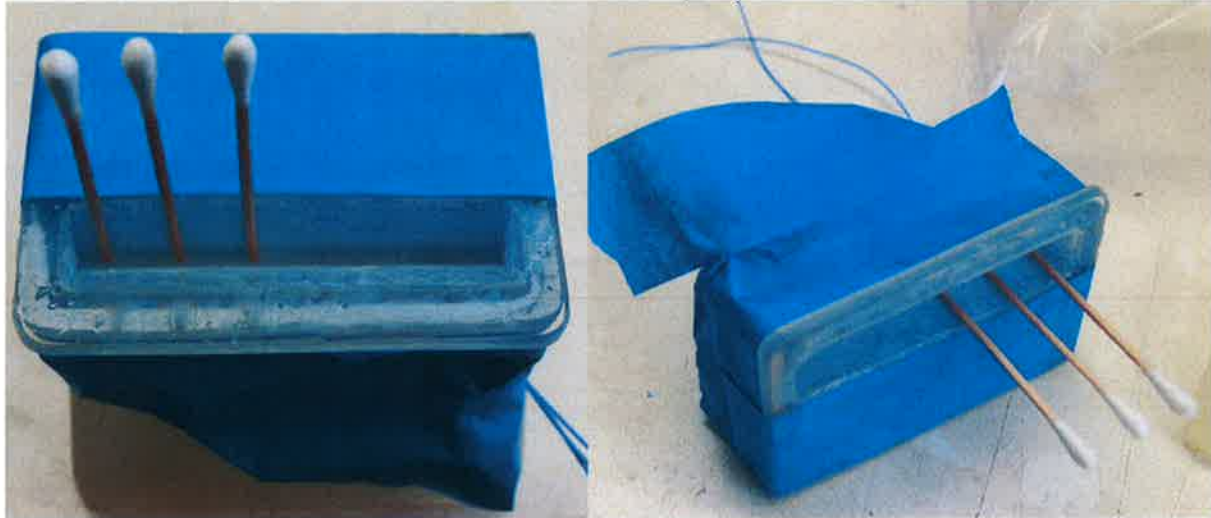
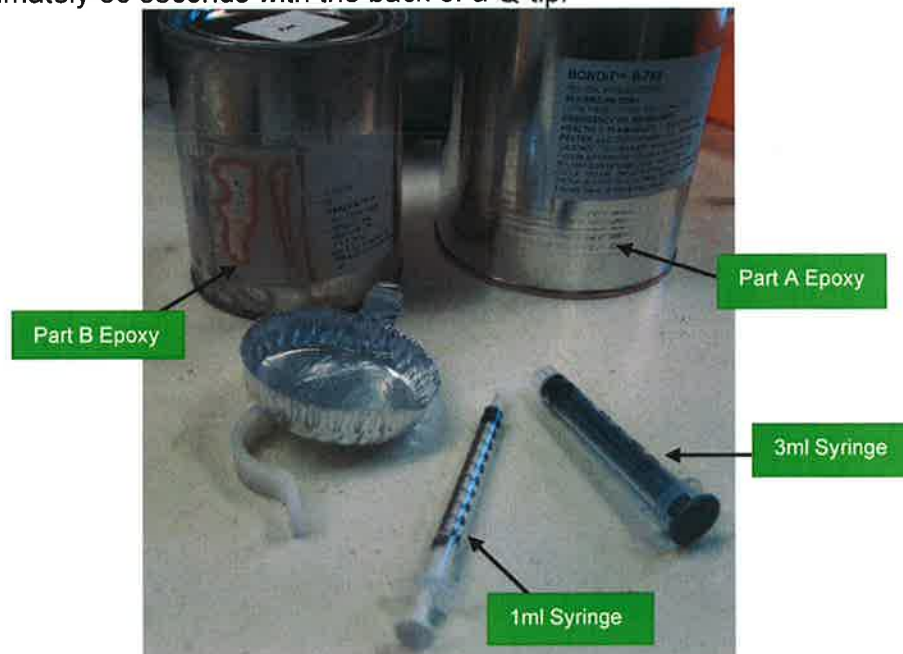


Figure 10: Taped Potting Jig

30. Mix the Epoxy [25061] in a foil cup by dispensing .75 ml of part B and 3ml of part A. This can be done by using a 1ml syringe for part B and 5 ml syringe for part A. Mix for approximately 30 seconds with the back of a Q-tip.



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31. De-gas the epoxy by placing the cup in the vacuum chamber. Allow vacuum to pull until the epoxy reaches a rolling boil and leave for 2 minutes.

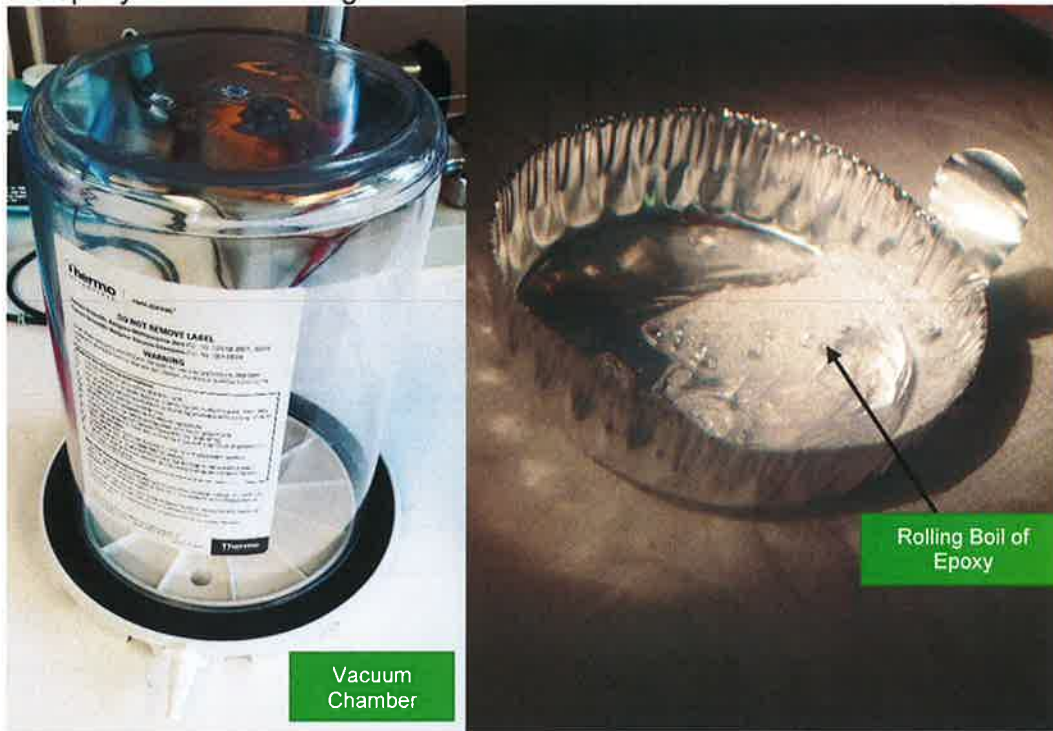


Figure 11: Epoxy under Vacuum

32. Pour the epoxy in the Potting Jig.
33. De-gas Potting jig with epoxy in it until the epoxy bubble mound falls. See Below for Example.

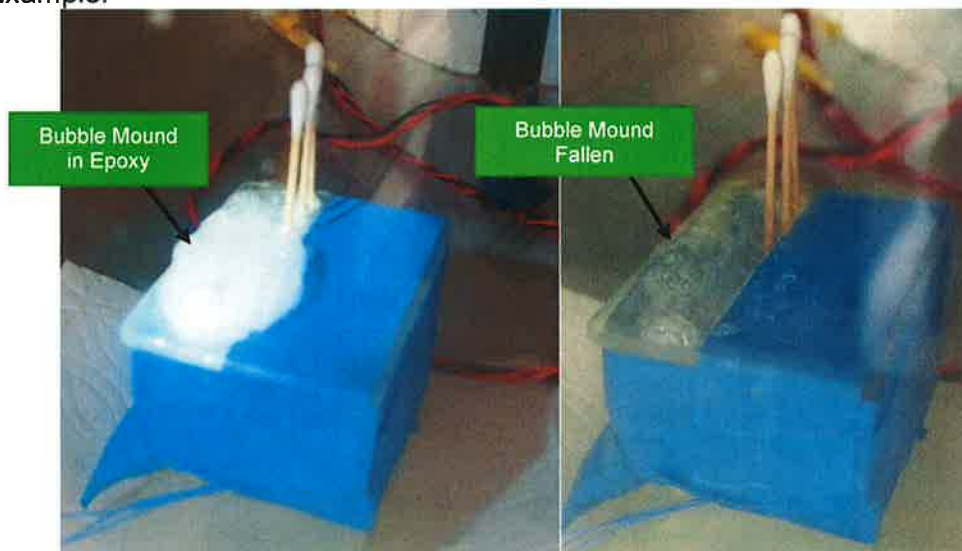


Figure 12: De-Gasing Potting Jig

34. Allow the Epoxy to cure overnight.
35. Following the overnight cure, check the remaining epoxy in potting jig. Make sure the epoxy is tack free and fully hardened. Remove the Reference Electrode Retainers from the Reference Body.

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36. Twist the Reference Body to break the epoxy and remove from the Potting Jig.
37. Clean the Potting Jig by ensuring all holes are clean. If there is epoxy in a hole push it out with a Q-tip. If there is any remaining epoxy on the Potting Jig surfaces remove those as well.
38. Trim off any excess epoxy flags on the Reference Bodies with the side cutters. **PIC needed.**

Note: It is recommended that the **step X-X** be done prior to this procedure and be stocked in the Cell.

39. Clean counter electrode [235578] with the ultrasonic cleaner for 180 seconds. Inspect the inner bore of the Counter Electrode for scratches. If scratches are found on the bore set aside to have the counter electrode inspected by a production engineer.
40. With the vise and the Roll Pin Guide Tool, press the gold roll pin [311619] into the counter electrode. You should feel a hard stop when the roll pin has gone to full depth. Make sure the split side of the roll pin is facing towards the center of the counter electrode. See Below for example.

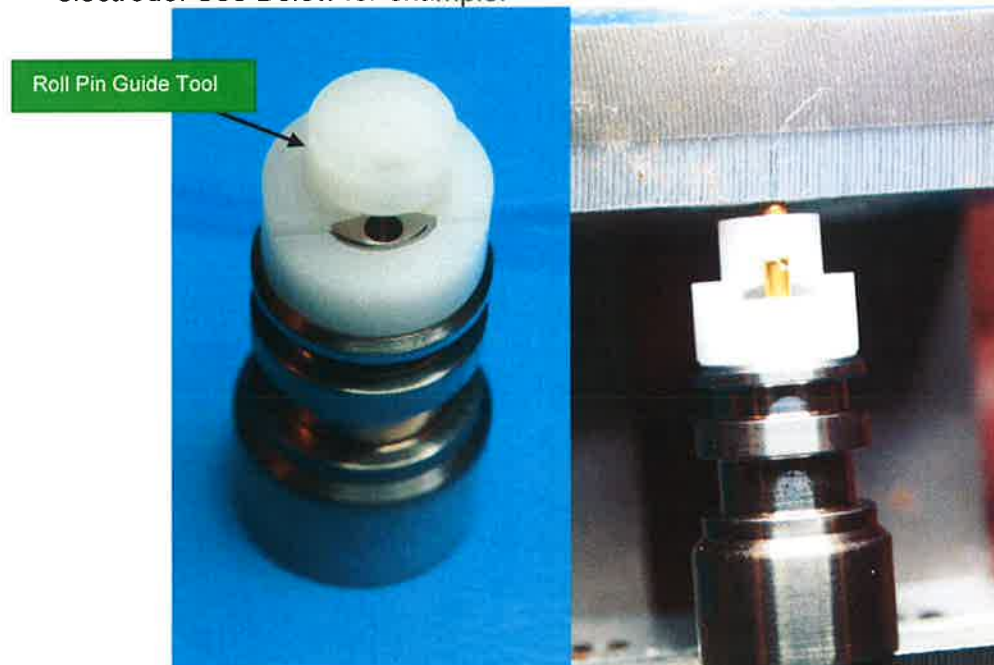


Figure 13: Roll Pin Pressed in Counter Electrode

41. Cut a 14" length of 30 gauge green wire. Strip on end of the wire by 0.125" (1/8").
42. Solder the wire to roll pin. Do this by placing the counter electrode into the counter electrode jig. Run the wire through the bent tubing and have the stripped end placed into the roll pin. Place flux on the roll pin and then begin soldering the wire to the roll pin via the slit in the roll pin.

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43. Clean off flux with alcohol.



Figure 14: Counter Electrode with Soldered Wire

44. Inspect the interior of the counter electrode for scratches.

45. Clean the interior of the electrode with a lint free swab and alcohol. Make sure no fibers remain.

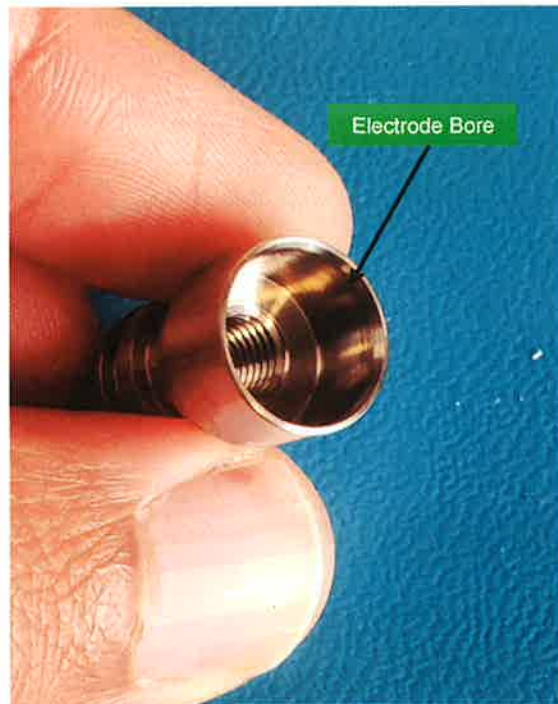


Figure 15: Electrode Bore

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46. Feed the wire through the counter electrode and thread the pH reference into the counter electrode.



Figure 16: Reference Electrode place in Counter Electrode

47. Cut a $\frac{3}{4}$ " length of heat shrink [31881]. Feed both wires through the heat shrink and slide the heat shrink up to the base. Shrink with a heat gun.

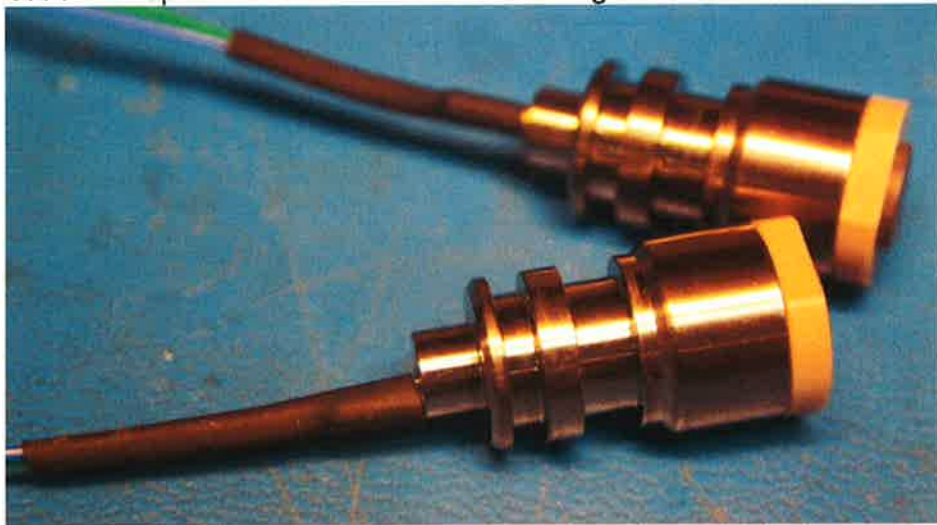


Figure 17: Heat Shrink at Base of Electrode.

48. Serialize the Electrode.
49. Hand the Electrode over to the machine to have the Reference Electrode faced per the specification of drawing 802754.

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50. When the Electrode is returned clean it with alcohol in an ultrasonic cleaner for approximately 90 seconds. Be sure to only submerge the Electrode halfway, **DO NOT** fully submerge the electrode. See Example Below.

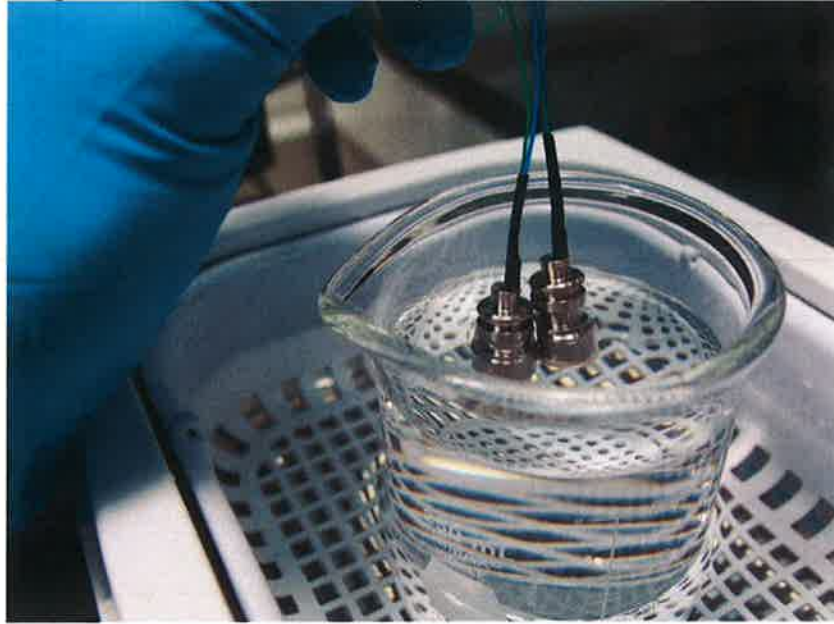


Figure 18: Ultrasonic Cleaning of pH Electrodes

51. Inspect, clean, and install two O-Rings [31976] (one is used as a retaining ring) on the pH Electrode per O-Ring specification in steps 9-11 of this document. Clean and check the surfaces of the pH Electrode as well.



Figure 19: O-Rings Installed on Electrode

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52. Clean the inner bore of the CAL housings with Kim wipes and alcohol. Inspect for any remaining fibers.



Figure 20: CAL Housing

53. Install the pH Electrode into the CAL housing.



Figure 21: pH Electrode in CAL Housing

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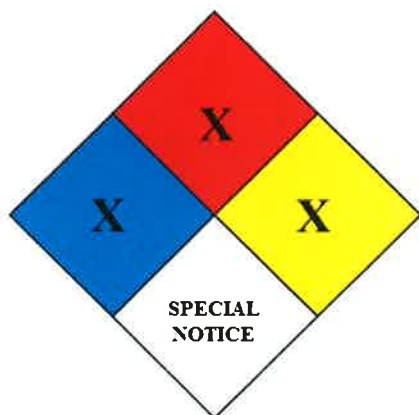
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History Log

[illegible]

READ ALL MSDS REPORTS

MSDS reports available:

Precautions

Associated Drawings

<u>Drawing Number</u>	<u>Drawing Title</u>

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