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Gravity Probe B Relativity Mission

PROCEDURE FOR STRIPPING THE ALUMINUM CLADDING FROM THE FIBER OPTIC CABLE

GP-B P0304 Rev -

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PROCEDURE FOR STRIPPING THE ALUMINUM CLADDING FROM THE FIBER OPTIC CABLE

Purpose:

To isolate the fiber optic cable electrically from the Gyro end of the cable to the Probe end of the fiber assembly.

Process Conditions:

- Performed on an acid bench with an exhaust hood
- Acid etch of aluminum clad with NaOH (5.0 Normal)
- Fiber assembly is submerged in a heated bath
- Fiber Optic cable is pre-cut to length and marked where etching is to be performed.
- Rubber gloves and safety goggles are used at all times
- Waste containers are available for disposal of used NaOH
- Reference drawing 23223-101 Rev B
- Travel sheet for Cable Assembly, Ultraviolet

Procedure:

1. Turn on exhaust hood
2. Place Heated bath under exhaust hood, place Fiber Holder Fixture into bath and fill with water until 1/4" compression fitting is just above the water.
3. Turn on heater to achieve a water temperature of approximately 75 degrees Fahrenheit.
4. Pour the NaOH into a labeled squeeze bottle and tap water into the other labeled bottle
5. Sand the fiber lightly with the sand paper at the area to be etched (~0.75").
6. Place the fiber into the fixture by removing the 1/16" compression fitting from one end of the fixture and inserting the fiber through the compression nut, retainer, and o-ring. Remove the 1/16" compression fitting on the opposite side and push the fiber through the Tee fixture until the fiber comes through. Now feed it through the 1/16" o-ring, retainer, and compression nut.
7. Tighten both 1/16" compression nut gently.
8. Insert the glass funnel into the 1/4" compression fitting. Do not let the funnel travel too far into the Tee because it could break the fiber. Tighten the 1/4" compression fitting.

9. Pour the tap water into the funnel and check for any leaks. If there are any leaks, check the appropriate compression fitting.
10. Remove the tap water by placing the fixture and funnel upside down.
11. Pour the NaOH into the funnel so that ~2" of NaOH is showing. Insert the glass stirring stick into the funnel and move it up and down to remove any air bubbles.
12. Place the fixture into the heated bath.
13. Let the NaOH etch the Aluminum for ≈45 minutes or after the NaOH solution stops bubbling. Dip the glass stirring stick into the funnel and move up and down about every 5 minutes.
14. Remove the fixture from the hot water bath.
15. refully remove the NaOH from the fixture by inverting and pouring into a waste disposal container.
16. Rinse the fixture with water thoroughly with the fiber still through the fixture.
17. Carefully remove the fiber by loosening both 1/16" compression nuts. The fiber is extremely delicate at the etch portion of the fiber. Be very careful not to place any pressure n the fiber.
18. Inspect the etch to ensure all the aluminum was etched.
19. Store etched fiber in a storage tube until you are ready to epoxy the ceramic sleeve to the fiber.

Total Duration: 1 hr per fiber