

# LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

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Approved: <hr style="width: 100%; border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> Site Operations Manager, Hanford Site	<b>Procedural Checklist for LHO Vacuum Bake Oven A</b>	Approved:  Approved:

The purpose of this procedure is to provide the famillure operator with a list of ordered steps to follow to successfully vacuum bake items for installation into the LIGO Vacuum Equipment.

## Procedure:

### Preliminary

1. Obtain and examine the travelers and waivers (if applicable) for the loaded items \_\_\_\_\_
2. Verify that all of the loaded items are compatible and suited/approved(?) for the specified bake temperature and soak time(s) \_\_\_\_\_
3. Prepare/clean parts as per LIGO-9600022 or as described on the traveler or waiver (if applicable) \_\_\_\_\_
4. Load parts \_\_\_\_\_

### Torquing Belljar Flange

1. Install fasteners finger tight with washer and nut facing upward \_\_\_\_\_
2. First torque all of the nuts to 30 ft-lbs then 70 ft-lbs, 110 ft-lbs and finally to 130 ft-lbs (use “star” pattern torquing sequence) \_\_\_\_\_
3. Wait 30 minutes \_\_\_\_\_
4. Retorque all of the nuts to 125 ft-lbs \_\_\_\_\_

### Roughing Down

1. Verify valves V-1, V-2, V-3, V-6 and V-7 are closed \_\_\_\_\_

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2. Verify valves V-4 and V-5 are open \_\_\_\_\_
3. Verify N2 bottle valve is open and regulator output valve is set for 0 psig  
(vent line) \_\_\_\_\_
4. Stop main turbo pump to vent pump side of V-2 \_\_\_\_\_
5. Close V-4 once main turbo pump has stopped (controller speed indicator  
LEDs not lit) \_\_\_\_\_
6. Verify pump side of V-2 is 0 psig by closing N2 regulator output valve  
and observing pressure shown on regulator output gauge (will indicate  
0 psig when vented) \_\_\_\_\_
7. Close output valve on N2 vent line regulator \_\_\_\_\_
8. Open V-2 \_\_\_\_\_
9. Gradually open V-4 to begin roughing down chamber \_\_\_\_\_

## Final Pumpdown

1. Verify foreline pressure is  $< 1$  torr \_\_\_\_\_
2. Start main turbo pump and wait until pump is at full speed \_\_\_\_\_
3. Open N2 regulator output valve and set vent line to 0 psig \_\_\_\_\_
4. Verify foreline pressure is  $< 3 \times 10^{-3}$  torr \_\_\_\_\_
5. Open V-3 \_\_\_\_\_

## Baking

1. Verify foreline pressure is less than or equal to what it was before  
opening V-3 \_\_\_\_\_
2. Program heating ramp/soak profile \_\_\_\_\_

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3. Assign profile to loops \_\_\_\_\_
4. Verify alarm setpoints are correct \_\_\_\_\_
5. Note the variac settings, foreline pressure and temperature of each  
heat zone \_\_\_\_\_
6. Verify both turbo pumps have forced air cooling \_\_\_\_\_
7. Start temperature data logging (trendplot) \_\_\_\_\_
8. Begin heating

## RGA Scan

1. Verify all heat zones are  $< 28^{\circ}\text{C}$  \_\_\_\_\_
2. Set all variacs to 0 % \_\_\_\_\_
3. Save temperature trendplot \_\_\_\_\_
4. Calibrate RGA detector \_\_\_\_\_
5. Peak tune RGA using Low AMU = 28 and High AMU = 44 \_\_\_\_\_
6. Verify electron multiplier is on and that Gain = 1,000,000 and that  
Voltage = 2400 \_\_\_\_\_
7. Take RGA Background Scan (RGA side of V-1background subtraction)\_\_\_\_\_
8. Open V-7 (Calibration Gas) \_\_\_\_\_
9. Open V-1 \_\_\_\_\_
10. Close V-2 \_\_\_\_\_
11. Wait 30 minutes \_\_\_\_\_
12. Take RGA Calibration Scan \_\_\_\_\_

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13. Close V-7 (Calibration Gas) \_\_\_\_\_
14. Wait 30 minutes \_\_\_\_\_
15. Take Post Bake Scan \_\_\_\_\_
16. Close V-1 \_\_\_\_\_
17. Open V-2 \_\_\_\_\_

## Venting

1. Copy scans to C:\bakeoven\rga and to "Wallula" C:\bakeoven\rga \_\_\_\_\_
2. Open scans using SRSRGA program and print out a hard copy of each \_\_\_\_\_
3. Have Post Bake Scan approved \_\_\_\_\_
4. Close V-2 \_\_\_\_\_
5. Verify output of N2 regulator is at 0 psig \_\_\_\_\_
6. Open V-6 \_\_\_\_\_
7. Wait 30 minutes \_\_\_\_\_
8. Close output of N2 regulator and verify reading is 0 psig \_\_\_\_\_
9. Open output of N2 regulator \_\_\_\_\_
10. Close V-6 \_\_\_\_\_