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| **L2HE Cavity Assembly Part 2** |
| **Document Number:** | L2HE-PR-CLNRM-CAV-ASSY2 | **Effective Date:** | DD Mmm YYYY |
| **Revision Number:** | R1 | **Periodic Review Date:** | DD Mmm YYYY |
| **Document Owner:** | T. Ganey | **Department Owner:** | SRF Operations |

# Purpose

This procedure describes the proper assembly steps for the final assembly of 9-cell L2 cavities, including the assembly the beamline flange after high pressure rinse (HPR). At the end of this procedure, the cavity is ready to be installed on the test stand.

# Scope

This procedure applies to <enter text>.

This procedure does not apply to <enter text>.

# Terms and Definitions

The following terms have specific meanings within this procedure.

|  |  |
| --- | --- |
| **Term** | **Definition** |
| <Term 1> | <Definition> |
| <Term 2> | <Definition> |
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# Roles and Responsibilities

The following roles have responsibilities described in this document.

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| **Role** | **Responsibility** |
| <Job Title> | <Very short summary of activities this job title performs in this procedure.> |
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# Procedure

Before proceeding with this activity, ensure that the cavity was high pressure rinsed and has been drying with the bottom (FPC) beam-line flange cover removed (do not approach open cavity at this time). Cavity will be assembled in the cage using a cage lifting fixture to hold the cavity and cage in place.

## Assembly Preparation

* This assembly consists of one sub-assembly--including a burst disk, right angle valve and the beam-line flange. All three of these parts, along with their gaskets, shall be sprayed with ionized nitrogen in accordance with the Ionized Nitrogen Cleaning Procedure.
* The right angle valve has a rotatable flange for the connection to the beam-line flange. The valve shall be rotated approximately 180 degrees from the port for the burst disk. Ensure the downstream flange on the right angle valve lands between two bolt holes on the beam-line flange. This is necessary to accommodate the installation of the beamline flange onto the cavity. Attach the valve to the beam-line flange using a copper 2 3/4” conflat gasket. Tighten all the bolts.
* Attach the burst disk to the mini conflat flange on the side of the beam-line flange and tighten all the bolts (again using a copper mini conflat gasket).
* Open the right angle valve. This assembly and an appropriate sized dust cover for the open 2 3/4” conflat flange can now be sprayed IAW (ionized n2 cleaning procedure link here). Cover and clamp the open flange.
* Place sub assembly on cart. Spray two M8 studs, four nuts, four washers and the Al beam-line gasket in accordance with the Ionized Nitrogen Cleaning Procedure.
* Sub-assembly and all fasteners are now ready to be moved to assembly area.

## Cavity Assembly

* Cavity is lifted with lift cart to eye level during assembly, either in the seated or standing position-depending on the assembler’s preference. The cage shall be attached to the lifting fixture such that the half containing the cross braces is being held by the fixture (this is necessary for attachment to test stand).
	+ The open cavity flange will not be covered with a dust cover for this assembly.
* At this time the cleanliness of the assembler’s glove should be verified, either by blowing off with nitrogen and verifying counts, or by replacing.
* Place two of the four N2 cleaned M8 washers and nuts on the matching studs.
* These studs are now placed through the beam-line blank flange. They should be located 180 degrees from each other.
* Place an aluminum gasket in the seal groove.
* The flange will be held in a manner that will keep the studs secure. Slowly and carefully bring the flange flush with the bottom cavity flange while the studs are moving through the bolt holes on the cavity.
	+ Rotation of the right angle valve is important for attachment of the vacuum system on the test stand. The sub-assembly shall be rotated such that the open flange on the right angle valve is in line with the He return line on the helium vessel (the dust cover on the open flange shall stay in place during the assembly).
* Place the remaining two N2 cleaned M8 washers and nuts on the studs and tighten by hand. These nuts can now be snugged with a wrench. They should be turned approximately 1/8 to 1/4 of a turn.
* Attach the remaining studs, washers and nuts to the flange using the fasteners that have not been cleaned with N2.
* Snug all fasteners with a wrench in the same manner as the first two. This shall be done in a star pattern, starting with one of the bolts that are ninety degrees from the original two that are already snugged.

## Final Torque Sequence

* Using a star pattern, torque all beam-line flange nuts to 12 ft/lbs.
* Using same star pattern, increase to 23 ft/lbs.
* Tighten all nuts again by walking the wrench around the flange at least two times while still having the toque wrench still set at 23 ft/lbs. If there is no movement on any of the nuts, you are finished.
* If necessary, keep walking the wrench around the flange until there is no movement of any nut.

## Final Preparation

* Using the lifting fixture, lower the cage into a roll cart.
* The cavity is now ready to be picked up with the two arm cavity lifting fixture for insertion onto test stand.

# References

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| **Document No.** | **Title** |
| [F10023864](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-248683/Cavity%20Drawing%20Package%20F10023864_rev_M_drawing_package.pdf) | Production Cavity Assembly Drawing |
| SRF-MSPR-CLNRM-CST-ION | Ionized Nitrogen Cleaning Procedure |
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# Release and Revision History

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| --- | --- | --- |
| **Rev #** | **Major Changes** | **Effective Date:** |
| 1 | Initial version, based on CP-L2PRO-CAV-SCND-R1 | DD Mmm YYY |
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# Approvals

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