|  |  |
| --- | --- |
| Traveler Title | P1 Cavity Assembly |
| Traveler Abstract | The following traveler documents the steps for the clean room cavity assemblies for VTA qualification of P1 cavities for the P1 project. These are cavities from the original cryomodule. The P1 cavity assemblies are very similar to the C100 assemblies. The radial wedge design was not used so the beam-line flanges are bolted. In addition the serpentine gasket is not used. There is a groove in the cavity FPC flange for an aluminum race track style gasket.  |
| Traveler ID | P1-CLNRM-CAV-ASSY |
| Traveler Revision  | R1 |
| Traveler Author | D. Forehand |
| Traveler Date | 3-Sep-20 |
| NCR Informative Emails | areilly |
| NCR Dispositioners | forehand,dreyfuss |
| D3 Emails | areilly,forehand,drefuss |
| Approval Names | D. Forehand | C. Dreyfuss | K. Davis | A. Reilly |
| Approval Signatures |  |  |  |  |
| Approval Dates |  |  |  |  |
| Approval Title | Author | Reviewer | Reviewer | Project Manager |

|  |  |
| --- | --- |
| References | List and Hyperlink all documents related to this traveler. This includes, but is not limited to: safety (THAs, SOPs, etc), drawings, procedures, and facility related documents. |
| [Ionized nitrogen parts cleaning procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-60314/Ionized%20nitrogen%20cleaning%5B1%5D.pdf) | Cavity tooling VTA Assembly drawing[CRM1207015-0100](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-60315/CRM1207015-0100%5B1%5D.pdf)(Slightly different for F100, Flange design) | [C100 1st assembly procedure for VTA qualification](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-60316/CP-C100-CAV-ASSY-R3.docx-1%5B1%5D.pdf) |  |  |
|  |  |  |  |  |

|  |  |
| --- | --- |
| Revision Note |  |
| R1 | Initial release of this Traveler. |

|  |  |  |
| --- | --- | --- |
| Step No. | Instructions | Data Input |
| 1 | * Record Cavity Serial Number
* Operators login
* Record date
* Use the D3 button at the top of the page to record a discrepancy or deviation that occurred before, during, or after the assembly.
 | [[CAVSN]] <<CAVSN>>[[AssemblyTech1]] <<SRFCVP>>[[AssemblyTech2]] <<SRFCVP>>[[AssemblyTech3]] <<SRFCVP>>[[RecordDate]] <<TIMESTAMP>> |
| 2 | * Inspect the FPC flange. The flange must be free of visible scratches and other surface imperfections in the seal path area.
	+ Verify that the flange has been lapped and there are no visible traces of gasket material from a previous assembly.
	+ Record any visual inspection notes in the comment box to the right.
* Inspect the tophat flange. The flange must be free of visible scratches and other surface imperfections in the seal path area.
	+ Verify that the flange has been lapped and there are no visible traces of gasket material from a previous assembly.
	+ Record any visual inspection notes in the comment box to the right.
 | [[FPCFlangeLapped]] <<YESNO>>[[TophatFlangeLapped]] <<YESNO>>[[FlangeInspTech]] <<SRFCVP>>[[Comments1]] <<COMMENT>> |

|  |  |  |
| --- | --- | --- |
| **Step No.** | **Instructions** | **Data Input** |
| 3 | * Perform first cavity assembly as per the [C100 1st assembly procedure for VTA qualification.](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-60316/CP-C100-CAV-ASSY-R3.docx-1%5B1%5D.pdf)
* Record length of field probe antenna as installed to cavity.
* Set and record length of the HOM antennas.
* Record tophat/input probe set serial number.
* Use the comment box to the right to record notes, etc. regarding this assembly.
* (Note: The radial wedge design was not used so the beam-line flanges are bolted. In addition the serpentine gasket is not used. There is a groove in the cavity FPC flange for an aluminum race track style gasket.)
* .040" indium will be used on both sides of a stainless race track seal. Indium is formed on both sides of the the stainless seal.
* The FPC flange has a final torque to 55" lbs on the long sides and 40" lbs on the ends. Again torque in steps using a star pattern.
 | [[FieldProbeLength]] <<FLOAT>>[[Comments2]] <<COMMENT>>[[CavAssemblyTech]] <<SRFCVP>>[[HOMALength]] <<FLOAT>>[[HOMBLength]] <<FLOAT>>[[Tophat\_InputProbeSet]] <<SN>> |
| 4 | * Record serial numbers:
* Use the diagram below for HOM identification.

 C:\Documents and Settings\castagno\Desktop\Nomenclature_C100.jpg  | [[TophatInputProbeSet]] <<SN>>[[FPFTSN]] <<FPFTSN>>[[PositionA\_HMFTSN]] <<HMFTSN>>[[PositionB\_HMFTSN]] <<HMFTSN>>[[Comments3]] <<COMMENT>>[[AssemblyTech]] <<SRFCVP>> |

|  |  |  |
| --- | --- | --- |
| **Step No.** | **Instructions** | **Data Input** |
| 1 | * Record Cavity Serial Number
* Operators login
* Record date
* Use the D3 button at the top of the page to record a discrepancy or deviation that occurred before, during, or after the assembly.
 | [[CAVSN]] <<CAVSN>>[[AssemblyTech1]] <<SRFCVP>>[[AssemblyTech2]] <<SRFCVP>>[[AssemblyTech3]] <<SRFCVP>>[[RecordDate]] <<TIMESTAMP>> |
| 2 | * Perform final cavity assembly as per the [C100 final cavity assembly procedure for VTA qualification](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-60271/CP-C100-CAV-ASSY2-R3l.docx%5B1%5D.pdf).
* Use the comment box at the right to record notes, etc., regarding this assembly.
* (Note: The radial wedge design was not used so the beam-line flanges are bolted. In addition the serpentine gasket is not used. There is a groove in the cavity FPC flange for an aluminum racetrack style gasket.)
* The final torque for the beam-line flanges are 40' lbs. Use a typical star pattern starting at 20' lbs then 30' lbs and finally 40' lbs.
* Re-check that all flanges have been torqued before moving to the next step.
 | [[Assembly\_Tech1]] <<SRFCVP>>[[Assembly\_Tech2]] <<SRFCVP>>[[Assembly\_Tech3]] <<SRFCVP>>[[FinalAssyComments]] <<COMMENT>>[[FlangeTorqueChecked]] <<SRFCVP>> |

|  |  |  |
| --- | --- | --- |
| **Step No.** | **Instructions** | **Data Input** |
| 3 | * Install the cavity into the test stand as per the [Cavity installation into test stand procedure.](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-60272/CP-CAV-INST-TSTD%5B1%5D%5B1%5D.pdf)
* Record the test stand serial #.
 | [[FirstAssemblyTech]] <<SRFCVP>>[[SecondAssemblyTech]] <<SRFCVP>>[[ThirdAssemblyTech]] <<SRFCVP>>[[TestStandSerialNo]] <<SN>>[[CavInstallToTestStandComments]] <<COMMENT>> |
| 4 | * Evacuate the cavity as per the [C100 cavity evacuation procedure.](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-60269/CP-C100-CAV-EVAC_comments%5B1%5D%5B1%5D.pdf)
* Record date and time of cavity evacuation.
* Record date and time turbo pump was established to system.
* Record total system pressure in mbar after turbo pump is operating at full speed.
* Allow the cavity to pump overnight.
 | [[AssemblyTech\_1]] <<SRFCVP>>[[SlowEvacStart]] <<TIMESTAMP>>[[TurboStart]] <<TIMESTAMP>>[[TotalPressure1]] <<SCINOT>>mbar |
| 5 | * After cavity has pumped overnight, record total system pressure in mbar.
* Leak test the cavity as per the [RGA Leak Test Procedure](https://jlabdoc.jlab.org/docushare/dsweb/Get/Document-60268/CP-C100-CAV-LKTS%5B1%5D%5B1%5D.pdf). If cavity is leak tight, save and upload the following files: Analog scan with multiplier on (.rga file), leak test summary with graph (.docx file or .jpg), RGA leak test scan (.rga file). If the cavity is not leak tight, initiate a D3 and contact your supervisor or lead technician.
* The leak tested cavity can now be transported to the VTA mezzanine for 120°F bake.
 | [[TotalPressure2]] <<SCINOT>>mbar[[First\_AssemblyTech]] <<SRFCVP>>[[IsCavityLeakTight]] <<YESNO>>[[AnalogScan]] <<FILEUPLOAD>>[[SummaryFile]] <<FILEUPLOAD>>[[LeakTestScan]] <<FILEUPLOAD>>[[LeakTestComment]] <<COMMENT>> |