Procedure Title C100 Final Cavity Assembly Procedure for VTA Qualification

Procedure ID # CP-C100-CAV-ASSY2

Procedure Description - The following procedure documents the steps necessary for the final clean room cavity assembly for VTA qualification of C100 cavities for the 12GeV project.

Author :	Steve Castagnola	Date : 5/13/2011	
Reviewer:	Kurt Macha	Date : 5/13/2011	
Version	3.0		
Approval Date			
Version Comments	• Step 1: Removed input probe feed through hardware list. (This will now be done during the first assembly.) • Removed steps 4 & 5 (This will now be done during the first assembly.) • Step 6: Added "If the beam-line gasket has been marked or labeled to be installed in a certain orientation with respect to mating flanges, verify that it is properly oriented to the beam-line flange."		
References	List and Hyperlink all documents related to this traveler.		
Burst disc drawing # CRM9005040-0005	Ionized nitrogen parts cleaning procedure	Radial wedge flange installation procedure	Drawing # CRM1207015-0100
	Cavity leak test procedure.	Cavity slow pump-down procedure	Insert cavity to test stand procedure

NOTE: All steps described within this document must be performed in the class 10 area of the main clean room unless otherwise noted. Prior to initiating this procedure, ensure the cavity has been rinsed a second time in the production HPR system and dried in the class 10 area.

1. Hardware list for this assembly

The following components must be UHV cleaned and placed in the pass thru for assembly. Refer to CRM1207015-0100 for component placement and specific details.

Pump out flange sub-assembly

1 pc. Cavity pump out flange
Double sided 2 ¾" CF flange with tube and 1.33" flange port
Burst Disk with 1.33" flange
2 ¾" Metal seal VAT valve (VAT part # 54032-GE02)
Appropriate silver plated CF hardware (bolts, studs, and nuts)
Appropriate Copper CF gaskets
2 ¾" blank CF flange

Beam-line

1 pc. Beam-line flange gasket
1 set Beam-line radial wedge flange hardware

2. Cover the cavity in the class 10 area

NOTE: *Attach flange covers with one motion as to not rotate or vibrate flanges once together. Never position your body or clothing over an opening. Replace and clean new gloves if they are damaged prior to, or during an operation. Only one personnel should be within the Class 10 area during this blanking operation. Inspect cavity sealing surfaces of cavity flanges as covers are installed.* Clean the handles and upper shelf of a clean room cart with an isopropyl soaked wiper. Clean the cart with ionized nitrogen. Clean the beam line cavity flange cover and clamp as per the ionized nitrogen parts cleaning procedure. Place the flange cover and clamp on the top shelf of the clean room cart. Transport the cart into the class 10 area. Clean/replace outer gloves prior to covering cavity. Cover the beam-line flange and clamp in place.

3. Prepare the cavity for assembly

Roll the cavity (with flange covers installed) out of the class 10 area and install caged cavity into the cavity manipulation lift. Position the lift cart so the cavity is back inside the class 10 area. Orient the cavity so that the beam axis is vertical and the FPC flange is in the upward most position. Raise the cavity as high as possible.

4. Assemble the pump-out manifold

At the N2 bench, partially open the valve and clean as per the ionized nitrogen parts cleaning procedure. Close the valve and clean with nitrogen again. Clean the remaining components, hardware, and as per the ionized nitrogen parts cleaning procedure. At the assembly workbench, assemble the cavity pump-out flange and right angle valve to the double sided conflat flange with the appropriate silver plated conflat hardware. Assemble the burst disk to the 1.33" conflat welded to the double sided conflat with the appropriate silver plated hardware. See figure 1 at

the end of this document for proper orientation. Properly tighten all fasteners included in this sub-assembly.

5. Prepare beam-line pump out manifold for installation onto cavity

Clean the handles and upper shelf of a clean room cart with an isopropyl soaked wiper. Clean the cart with ionized nitrogen. Place four clean room wipers on the cleaned cart. Gather the following tools:

- ½" wrench
- 3/8" Ratchet with a 5/16" deep socket

Clean the tools with ionized nitrogen and place them on the first wiper on the cart. Clean the beam line clamping hardware with ionized nitrogen and place on the second wiper on the cart for easy assembly access. **NOTE**: refer to the radial wedge flange clamp installation procedure for proper hardware setup. Clean the beam line pump-out manifold as per the ionized nitrogen parts cleaning procedure and place it on the third wiper. Clean the aluminum beam line gasket with ionized nitrogen and place it on the fourth wiper.

6. Assemble the beam-line pump-out manifold to cavity

Clean/replace outer gloves prior to assembly. If the beam-line gasket has been marked or labeled to be installed in a certain orientation with respect to mating flanges, verify that it is properly oriented to the beam-line flange. Assemble the pump-out flange sub-assembly to the remaining beam line flange of the cavity. Orient the sub-assembly so that the valve flange is 180° from the FPC flange. Assemble and tighten the radial wedge clamp as per the Radial wedge flange clamp installation procedure. Remove the cavity from the class 10 area.

7. Ensure all hardware is properly torqued

Verify that **all** cavity flanges have been torqued to the proper value. The cavity is now ready to be installed into the test stand.

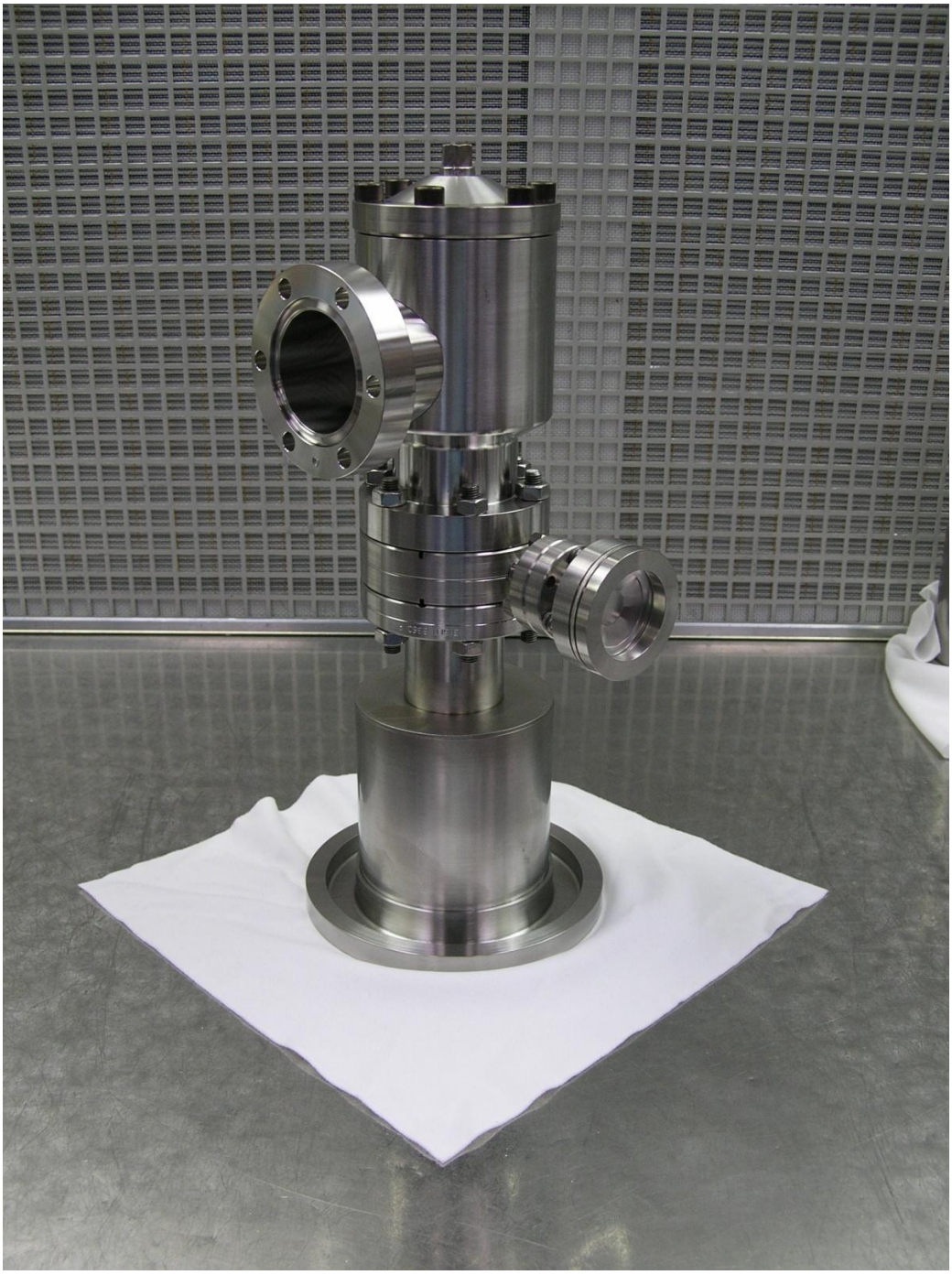

Figure 1: Cavity pump-out flange sub assembly