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| **L2HE Qualified Cavity Vacuum Check** |
| **Document Number:** | L2HE-PR-CLNRM- | **Effective Date:** | 01 DEC 2023 |
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| **Document Owner:** | C. Dreyfuss | **Department Owner:** | SRF Operations |

# Purpose

The purpose of this document is to provide instructions for connecting the cleanroom purge system to the L2HE qualified cavities for string assembly to verify cavity vacuum is the proper range for cavity string assembly. It will also cover pumping down a cavity and backfilling a cavity with the purge system.

# Scope

This procedure applies to L2HE qualified cavities for a string. This work will be performed in the cleanroom. This procedure will apply to all qualified cavities before string builds.

# Terms and Definitions

The following terms have specific meanings within this procedure.

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| **Term** | **Definition** |
| RAV | Right Angle Valve |
| Spec 1 | Particle counts are to be zero on all scales except 0.3 um, which can be zero or 1 in five seconds. |
| Spec 2 | Particle counts are to be one count per second or less on the 1 um scale. This is equivalent to particle counts |
| Standby | Closes the pneumatic valve and MFC (under the floor), and does not allow gas to flow |
| Blowout | Opens the pneumatic valve and opens the MFC fully to allow for gas flow at approximately 7 L/min |
| Backfill | Opens the pneumatic valve and opens the MFC to allow for gas flow at approximately 300 SCCM |
| CTV | Cavity Transfer Vehicle  |
| IPA | Isopropanol Alcohol  |

# Roles and Responsibilities

Assembly Technicians – Knowledgeable persons in cavity vacuum system, cavity string, and cavity assembly building.

# Procedure

**Prepare RAV:**

1:With the L2HE cavity on a CTV wire cartblow down the cavity with ionized N2 in accordance with the Ionized Nitrogen Cleaning Procedure. General cavity to Spec 2. Cavity flange, bolt holes, and inside the right angle valve up to the valve stem to Spec 1**.**

2: Prepare the Purge Line Spool for assembly to the cavity right angle valve. Set the purge software to "Standby" and verify the baratron is reading close to 40 mbar above zero. Remove the blank, gasket, and all fasteners from the Spool. Wipe bolt holes and flange sealing surface with IPA. One technician shall hold the Spool and point the opening away from the string, people, and any other critical components such as a cavity bays and prepared / cleaned parts. Angle the opening towards the floor until the Spool is ready to be installed onto the right angle valve. A second technician shall perform the purge system set up and particle counts. Set the purge software to "Blowout". Flow N2 through the Spool until Spec 1 is reached for two full cycles. Set the purge software to "Purge".

3: Install the Purge Line Spool to the cavity right angle valve. Place a new cleaned [Spec 1] gasket on the Spool. Install two pre-cleaned [Spec1] studs opposite each other and snug with wrench. Install the four remaining studs tighten all studs using a standard pattern for a round flange. Verify the purge turns off.

4:Set the purge software to "Standby". Pump down the purge header and the purge line to the closed right angle valve on the cavity. Allow the header to pump to the mid E-05 Mbar range. While monitoring the cavity pressure, slowly open the cavity right angle valve.

* If the cavity pressure reads at the 5.0E-4Mbar range or lower let cavity pump back down to E-05 Mbar or lower and then reclose the RAV.
* If cavity pressure is between 5.0E-04 and 5.0E-02Mbar let the cavity pump back down to at least E-05 range or lower, close the RAV and then a **D3 must be written at this time recording the pressure of the cavity**.
* If pressure in the cavity is 5.0E-0 Mbar or higher start the slow bleed up “Backfill” of the cavity and notify the cleanroom supervisor an **NCR must be written at this time**.

5: Label the cavity with the vacuum status, remove cavity from CTV wire cart and put back onto cavity storage rack. Place next cavity onto CTV and repeat process for all qualified string cavities.

# References

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| **Document No.** | **Title** |
| 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 | 01 DEC 2023 |

# Approvals

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