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| **Ionized Nitrogen Parts Cleaning** |
| **Document Number:** | SRF-MSPR-CLNRM-CST-ION | **Effective Date:** | 20 Jan 2023 |
| **Revision Number:** | R3 | **Periodic Review Date:** | N/A |
| **Document Owner:** | D. Forehand | **Department Owner:** | SRF Operations |

# Purpose

The purpose of this document is to provide instructions for the preferred method of ionized Nitrogen cleaning of parts for SRF.

# Terms and Definitions

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| **Term** | **Definition** |
| Spec 1 | Particle counts are to be zero on all scales except 0.3µm, which can be zero or 1 in ten seconds. |
| Spec 2 | Particle counts can be 1 count per second or less on the 1µm scale. This is equivalent to particle counts ≤ 10 counts per 10 second cycle on the 1 µm scale. |

# Procedure

**Chemistry:**

* After parts have dried, spray parts with ionized N2 until particle counts meet or exceed spec 2 on the particle counter. For fasteners and hardware, an item or representative sample should be checked to see if it can be brought to spec 2 in a reasonable time frame. If not, the part should be sent back for re-cleaning.
* Bag the parts in cleanroom bagging material.
* The parts can then be placed in the cleanroom pass-through or proceed to the next work center.

**Assembly:**

* All associated hardware and flanges should already be UHV cleaned, bagged and ready in the production pass-through.

The parts cart shall be cleaned off with alcohol and several clean-room wipes spread out for the parts to rest on. Remove the associated hardware from the pass-through and layout on a table to ensure all the parts are there.

* The nitrogen cleaning table shall be sprayed with ionized N2 to verify cleanliness before any of the parts are blown off table to spec 1 on the particle counter. If the table particle counts are above 1 on any scale the table should be blown until the counts drop below one, or in extreme conditions the table will need to be wiped down with DI water and be allowed to dry.
* Appropriate sized dust covers for all flanges will be sprayed until they meet or exceed spec 2 on the particle counter and placed on cart.
* The tips of an appropriate number of spring clamps shall be sprayed until they reach or exceed spec 2 on the particle counter and placed on cart.
* Dust covers can now be placed on assembly IAW the appropriate assembly procedure.
* As the flanges and gaskets are removed from the bags, they shall be inspected visually for any defects that might cause problems with sealing during the assembly. If any scratches or defects are found, the part shall not be used for the assembly. If the issue cannot be resolved immediately, the assembly will be delayed until replacement or repaired parts are available.
* As parts are placed on the cart, ensure that they are laid out in a manner that allows the assembly tech to pick up the needed pieces without reaching over any parts that will be used later in the assembly.
* If the assembly will require any number of sub-assemblies, perform the following steps.

If no sub-assemblies are needed move on to the next step.

* + Any gaskets needed for sub-assemblies can be sprayed with ionized N2 until they are able to meet or exceed spec 1 on the particle counter. Place the gaskets on the parts cart.
	+ At this time all the sub-assembly flanges shall be sprayed with the ionized nitrogen until all counts reach spec 2 on the particle counter. They shall then be placed on a cloth wiper on the parts cart.
	+ These parts can now be put together and made into the appropriate sub-assemblies.
	+ The sub-assemblies can now be sprayed again until they reach or exceed spec 1i on the particle counter.
* All flanges and associated gaskets shall be sprayed with ionized N2 until they reach or exceed spec 1 on the particle counter. Parts can be carefully placed on cart.
* All tools to be used during assembly shall also be sprayed until they reach or exceed spec 2 and placed on the cart.
* After all the proceeding steps are satisfied, the cart can be moved to the assembly area.

# Release and Revision History

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| **Rev #** | **Major Changes** | **Effective Date:** |
| 1 | Initial version, based on CP-SNSPPU-CLNRM-CST-ION-R1 | 22 Nov 2021 |
| 2 | Added steps for chemistry Ionized N2 cleaning | 26 Jan 2022 |
| 3 | Revised definition of Spec 1 from five seconds to 10 seconds to align with the work practice. | 20 Jan 2023 |

# Approvals

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