

# Flange Bolt Hole Cleaning in Chem Room

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## 1 Purpose

This procedure is to be executed in the Production Chemistry Water Room. It describes the methods to clean the bolt holes of a flange which is usually necessary prior to disassembly; primarily on a cavity. This procedure may also apply in association with the purge system (including connection of the purge system to a cavity string right angle valve), installation of a coupler, or assembly of cavities to bellows, etc.

## 2 Scope

### Master Procedure:

This Master Procedure is intended to be generalized such that it could apply to most items. The Project Manager or Scientific Lead for the project is encouraged to provide project specific instructions to supplement this procedure, which are to be attached to the applicable Traveler or in a project specific procedure. A calling document may contain additional or more specific information.

## 3 Terms and Definitions

The following terms have specific meanings within this procedure.

Term	Definition
N <sub>2</sub>	Nitrogen, filtered & ionized nitrogen is most commonly used and preferred.
Solvent	Clean room or electronics grade quality Acetone, Methanol, or Isopropyl /Isopropanol/2-propanol (IPA) are kept stocked.
Wipers	Texwipe Brand TX1008 Sealed Border Alpha Wipe, TX8410 Prewet Texwipe (ISO 4 cleanroom) "red bag", TX1009B Alpha Wipes, and TX2009 Beta Wipes are typically kept stocked.
Q-tip/ Swabs	Texwipe Brand TX710A, TX754B, & TX714A CleanTip Swabs are typically kept stocked.
Fasteners	Studs or bolts used to secure items together. May also be referred to as hardware.
CTV	Cavity Transport Vehicle, a cart with fixturing or tooling to support a cavity.
Calling document	The traveler or procedure that called (referenced) this procedure to be executed. The calling document provides additional specific information for the flange assembly / disassembly.
Spec 1	Particle counts are to be zero on all scales except 0.3 µm, which can be zero or 1 in five seconds in accordance with the Ionized N <sub>2</sub> Parts Cleaning Procedure.
Spec 2	Particle counts are to be one count per second or less (<10 counts per 10 second cycle) on the 1 µm scale in accordance with the Ionized N <sub>2</sub> Parts Cleaning Procedure.

## 4 Roles and Responsibilities

The following roles have responsibilities described in this document.

Role	Responsibility
Technician	A trained, qualified person who will execute this procedure.
PI/PM/TR/SL/WCL	Principal Investigator, Project Manager, Technical Representative, Scientific Lead, and Work Center Lead (supervisor). Someone knowledgeable of or in charge of the project or item in question who can provide guidance if questions arise.

## 5 Safety

The individual must keep safety as the first priority in the process; before beginning any job, the user must assure they have the correct PPE for the individual job. Maintaining the level of safety and secure nature of the work area is paramount. Assure personal safety by using caution in movement and taking necessary steps to avoid unnecessary personnel in the immediate area.

## 6 Procedure

**Note:** This procedure is typically executed in the ISO-6 area of the chemistry room.

### 6.1 Preparation

1. The flange is generally cleaned so the beam line is horizontal on a CTV, but may be cleaned vertically in a cage or BackTech if necessary.
2. Gather necessary supplies and materials.
  - a. Pre-cleaned (to Spec 1) clamps:
    - i. Quantity 2 for flanges with 6 or fewer fasteners
    - ii. Quantity 4 for flanges with more than 6 fasteners.
    - iii. Clamps should not be attached to the flanges yet, remove if necessary.
  - b. Tools, swabs, etc.
3. Gather necessary PPE.
  - a. Follow chem room OSP for guidance.
  - b. Safety glasses or goggles are required when working with solvents.
  - c. Hearing protection is recommended when using the nitrogen gun on bolt holes.
4. Work in the cleanest area possible.
  - a. This procedure is usually performed in the cleanroom.
    - i. Standard cleanroom attire required.
  - b. If working in the Production Chemistry Room, work in or near the ISO-6 area.
    - i. Stay "downwind" of the flange in relation to room airflow towards the exhaust vents.
    - ii. Don cleanroom hair net, face mask, and overcoat.
5. Don a new pair of clean room gloves.
  - a. Change gloves frequently to maintain cleanliness and when deteriorated by solvents.
6. Ensure the item is clean and not under vacuum before proceeding with bolt hole cleaning.
  - a. If not clean, perform the following steps prior to section 6.2.
    - i. Wipe down the entire surface of the item with pre-wet or wetted acetone wipes to remove any contamination such as tape, dust, marker, oils, grease, soil, etc.
    - ii. Repeat the wipe down with pre-wet or wetted isopropyl alcohol wipes.
    - iii. Using a squeeze bottle of isopropyl, drench the entire item or a large section around where the bolt hole cleaning will occur if the item is especially large.

- A. Focus extra attention to areas that may trap particulates such as around bellows, helium tank bellows clamps, in the grooves of all flanges, etc.

## 6.2 Bolt Hole Cleaning

1. Don a new pair of clean room gloves, change gloves frequently to maintain cleanliness.
2. Using ionized nitrogen, blow down the areas immediately around the flanges to Spec 1.
3. Remove the appropriate number of existing fasteners in a star pattern so that the remaining fasteners are evenly spaced around the flange.
  - a. If the flange has 6 or fewer studs or screws, 2 fasteners will be removed at this time.
  - b. If the flange has more than 6 studs or screws, 4 fasteners will be removed at this time.
  - c. This may vary by flange type, if uncertain, consult the PI or WCL.
4. Using a clean room swab dampened with IPA then N<sub>2</sub>, clean each exposed bolt hole to Spec 1 in accordance with the [Ionized Nitrogen Cleaning Procedure](#).
5. Secure the flanges for the removal of the remaining fasteners.
  - a. Install pre-cleaned stainless-steel clamps on each flange.
    - i. If the flange has 6 or fewer fasteners, 2 clamps will be installed at this time.
    - ii. If the flange has more than 6 fasteners, 4 clamps will be installed at this time.
6. Continue to remove the original fasteners on the flange in a star pattern until only the clamps from step 5 remain installed.
7. Repeat step 6.2.4.
8. Repeat steps 6.2.2 through 7 for each additional flange needing bolt hole cleaning.
  - a. If multiple flanges are located close together, it may be necessary to repeat the IPA or N<sub>2</sub> cleaning on each flange and surrounding areas until Spec 1 is reached.
9. Advance the item to the next step or work center.

## 7 References

Document No.	Title
SRF-01-ML-001	SRF Quality Manual
SRF-20-102692-OSP	Production Chemistry Room OSP
<a href="#">SRF-MSPR-CLNRM-CST-ION</a>	Ionized Nitrogen Parts Cleaning Procedure






## 8 Release and Revision History

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1	Initial version	06 OCT 2022

## 9 Approvals

Approved by:	Name:	Signature:	Date:
Document Owner	A. Wildeson		DD Mmm YYYY

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Step 1: Approval, 100% respond								
	Alex Wildeson				Approved	10/12/22	-	1 (Version-148227)
	Tiffany Ganey				Approved	10/11/22	-	1 (Version-148227)
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