Understanding the Basis of Contamination Control

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Understanding the Basis of Contamination Control

- **Overview of Cleanroom Compliance**
  - Entry into the Grade A area
  - Gowning Rooms
  - General Concepts
  - Phone Use
  - Periodic Gown Evaluations
  - Handling of Tools

Understanding the Basis of Contamination Control

- **Overview of Cleanroom Compliance**
  - Paperwork/Documentation
  - Use of Office Items
  - Contact with the floor
  - Equipment Pass Thru/Airlocks
  - Environmental Monitoring Equipment
  - Handling Trash Cans

Understanding the Basis of Contamination Control

- **Aseptic Technique**
  - The set of practices, precautions and behaviors used to avoid contamination when working with media, cell culture, final product or other critical items

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- **Common Cause of Contamination**
  - Poor aseptic techniques
  - Lack of understanding of airflow patterns
  - Not using the First Air Concept
  - Gowning
  - Do not have basic understanding on microbiology

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- **Types of Contamination**
  - Microbial
    - People, improper gowning and coughing
    - Items passed through into the clean room
    - Cleaning, Sanitization and Sporicide program in adequate
    - Leaks in HEPA filters

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- **Types of Contamination**
  - Particulate
    - People
    - Improper gowning
    - Gowns shedding particulates
    - Lint left after wiping with sterile wipes
    - Spraying hands with alcohol
    - Pressure differentials

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- **Types of Contamination**
  - Chemical
    - Disinfectants remaining on surfaces of filling equipment
    - Hypo/Spore Klenz crystals on surface of items entering the clean room
    - Residual from previous products
    - Incorrect sanitizers used on gloves

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- **Gown Rooms**
  - Evaluate how gowning supplies are brought into the gowning room
  - Gowning supply cabinet must be on the same cleaning/sanitization schedule as the gowning room
  - First-In, First-Out system must be used
  - Lean bars/rails to assist in gowning are recommended

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- **Gown Rooms**
  - Ensure correct gowning supplies are available prior to initiating gowning
  - Make sure gowning supplies are within expiration dates
  - Confirm there is alcohol within expiry
  - Saturated wipes not recommended due to amount of alcohol transferred which effects contact time

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- **Gown Rooms**
  - Touch-less dispensers are not recommended because
    - They have to be maintained
    - Interior and exterior cleaned and sanitized
    - Becomes an EM sample location
    - Replace frequently through out filling operations

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- **Gown Rooms**
  - Sufficient hand sanitizer must be used to provide sufficient contact time
  - Employee card access identification must be worn under the sterile garments
  - No personal effects are to be brought into the clean rooms
  - Do not touch walls/floors while gowning

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- **Gown Rooms**
  - Ensure proper gowning techniques are followed
  - Sanitize hands with 70% sterile alcohol between each gowning step
  - Confirm there is no visible exposed skin or exposed hair after gowning is completed
  - Gown/Gloves must be intact with no tears
  - Do not sanitize hands after final gloving

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- **Glove Use**
  - Sanitize gloves downstream and away from
    - Aseptic operations
    - Open components
    - EM equipment
  - Sanitize hands
    - Before each operation
    - Prefer operators use leave container stationary and spray gloves

Contamination Control in Aseptic Processing

- **Process Components**
  - Sanitizing Gloves

Picking Up Can

Leave Can In Place

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- **Glove Use**
  - Ensure all surfaces of the glove are sanitized
    - SOP should define how to sanitize gloves
  - The SOP should define amount of alcohol to apply to the gloves
  - Change gloves
    - If compromised
    - After FIP monitoring
    - Before critical aseptic manipulations

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- **Glove Use**
  - Ensure gloves do not pull away from sleeves
    - Many gowns have finger loops
    - Sterile gowning tape is available
  - Do not sanitize hands prior to FIP monitoring

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- **Clean Room Behavior**
  - Do not reach over critical areas if possible.
  - Use First Air concept at all times
  - If unable comply with the First Air principle,
    - Place a sterile cover over the area prior to performing the process
    - Sanitize the area after operation
    - The item/vials impacted should be removed

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- **Clean Room Behavior**
  - Minimize movement in the aseptic areas
    - Move slowly and deliberately
    - Keep movements to approximately 180 ft/min or less if possible
    - Minimize disruption of air in the critical areas by walking in the Grade B-Areas
    - Always note where the HEPA's and air returns are located

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- **Clean Room Behavior**
  - Keep hands above vial and/or waist height
  - There is no requirement for palms up or down
    - In most cases, the operator stands in the Grade-B areas
  - Do not adjust goggles in the clean room
  - If goggles become fogged, exit the fill room and replace eye cover

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- **Clean Room Behavior**
  - Don’t contact walls, floors or other operators
  - Avoid letting the gown touch
    - Lexan, tanks, doors and equipment
    - Tools, clipboard and sterile wipes etc.
  - Discard all trash into proper receptacles
  - Avoid dropping trash onto the floor

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- **Clean Room Behavior**
  - Discard wipe after cleaning spills and change gloves
  - Avoid coughing and/or sneezing due to impact on mask
  - Minimize talking
  - Do not spray alcohol on the gown or sterile sleeves

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- **Clean Room Behavior**
  - Forceps use
    - Remove from package using First-Air concepts
    - Forceps that leave the Grade A areas must be changed
    - Must not fall below vial height

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- **Clean Room Behavior**
  - Forceps use
    - Do not put forceps in alcohol to store
      - ✓ Concentration goes down over time
      - ✓ Need to sample the alcohol at the end of fill for concentration and bioburden
    - Do not hold forceps below the grip area and the tip to reduce the potential for contamination

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- **Clean Room Behavior**
  - Forceps use
    - When removing vials from the filling line,
      - ✓ They must be dropped into the hands and not taken from the hand
      - ✓ Dropped into a trash can
    - Ensure operators do not interfere with the First-Air to the forceps
    - Store tips up not down

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- **Clean Room Behavior**
  - Forceps use

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- **Clean Room Behavior**
  - Electrical points
    - All outlets must be GFI design
    - Ensure outlets are covered after use
    - Eliminate or minimize the use of electrical cords
    - If cords are required, confirm they are as short as possible and included as an EM sample location

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- **Clean Room Behavior**
  - Use of chairs
    - Must be 100% 316 stainless steel
    - Non adjustable
      - ✓No screw or pistons
      - ✓Fixed back rest
    - Do not touch chair
    - No arm rests

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- **Clean Room Behavior**
  - Use of chairs
    - Easy to sanitize
      - ✓Difficult to reach areas during sanitization
      - ✓Bottom/Underneath seat must be finished
      - ✓No wheels

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- **Clean Room Behavior**
  - Use of chairs
    - Remain in the B-Areas if possible
    - Keep numbers to a minimum
    - Must inspect on a routine basis for presence of rouge/rust
    - Must be a EM sample location
      - ✓Not the flat surface but difficult to sanitize areas

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- **Aseptic/Support Operator System**
  - Commodities should be double wrapped
  - Support operator
    - Opens the cabinet doors if applicable
    - Opens the outer bag in the Grade A areas
    - Must not touch the inner bag
  - The sterile operator must not to touch the outer bag
  - The sterile operator will remove and open the final container in the Grade A area

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- **Aseptic/Support Operator System**
  - The sterile outer wrapping can be passed to the support operator, dropped onto a cart or into a trash container
  - If the operation is critical, recommend sampling gloves when completed

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- **Phone Use**
  - Phones should have flat surface touch pads
  - A one touch intercom system is preferred to contact personnel viewing the fill
  - Minimize phone use
  - Sanitize hands before and after use
  - A sterile wipe can be used to dial and hold the phone

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- **Phone Use**
  - Walkie-talkie can be used
    - Surface sanitize the item
    - Place walkie-talkie in a previously sterilized Tyvek bag that has a clear side
    - Sanitize before and after use
    - Must be a EM sample location
  - Some companies allow company cell phones in the clean room

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- **Use and Handling of Discard Container**
  - Change gloves if the can or bag is touched
  - Do not push items down in the container
    - With hands, forceps and/or sterile push rod
    - Do not crumple items and throw into the waste can with significant force
    - This will cause contaminated air from the interior of the waste to enter the room

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- **Use and Handling of Discard Cans**
  - Containers must not block air return vents storage racks and/or doors
  - Use sterile discard bags in the cleanroom
  - Do not over fill with waste
  - Do not use cans with flip covers in the aseptic areas due to disruption of the air
  - Cans should have defined locations
  - Evaluate airflow for each trash receptacle

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- **Use and Handling of Discard Cans**
  - Define the methods and systems for removing trash
  - Is there a defined pass through to remove the trash
  - Operator touching the bag or container
    - Can’t touch any items including the doors
    - Must be escorted out of the room
    - Re-gowning is required

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- **Use and Handling of Discard Cans**
  - Evaluate the risk of removing the trash during filling operations
    - May have no significant impact on operations
  - Must perform airflow studies for discard containers

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- **Use of Aseptic Tools**
  - Non sterilized tools
    - Must be cleaned prior to sporicide application
    - Must be wiped down with sterile 70% alcohol to remove the sporicide
    - Sanitize with alcohol prior to use
  - Store tools in appropriate location
  - Tool storage area must be on a routine cleaning, sanitization and sporicide schedule

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- **Use of Aseptic Tools**
  - Tool box must be on the EM program
  - Don’t use tools that have touched the floor*
  - Do not place tools on a sanitized surface such as the filler deck
    - Place on a sterile wipe, bio-shield or alcohol wipe

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- **Use of Aseptic Tools**
  - Autoclaved tools
    - Double or triple bag
    - Purchase high quality 316 SS
    - Steri Tool or Snap-On are good resource
    - Sterilized on a per fill basis
    - Difficult to keep from walking away

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- **Use of Aseptic Tools**
  - Wrenches
    - Do not use adjustable wrenches
    - Use only defined sized wrenches
  - Avoid using pliers, difficult to sterilize
  - Inspect tools frequently to assess for deterioration and/or rust
  - Must be on routine EM program
  - Do not store used tools below vial height

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- **Use Office Items**
  - Use sterile pens and sharpies per fill
  - Calculator, keyboards and touch screens should have a flat key pad for easy sanitization
    - Sanitize hands before and after use
    - Sanitize item before and after use

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- **Paperwork**
  - Use low particulate autoclave paper
  - Paperwork should be autoclaved
    - Confirm a BI was placed in the middle of paper during validation
    - In most cases, the number of sheets of paper to be autoclaved at once is 10-15

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- **Paperwork**
  - SOP’s can be placed in sanitizable sleeves
  - Sanitize hands before and after touching paper items
  - No paper should be taken into the Grade A areas
  - Sterilizable stickers are now available

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- **Floor Contact**
  - Necessary items that fall to the floor
    - Pick up with sterile wipe
    - Spray with a sporicidal agent and let stand for 5 minutes
    - Wipe item with 70% alcohol Operator must change gloves
    - Procedure must be qualified/validated
    - EM sample required post fill
    - In most cases, backup items are available

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- **Floor Contact**
  - Un-necessary items that fall to the floor
    - Move item with your foot to a safe area
    - Do not pick the item up

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- **Floor Contact**
  - Do not touch the floor with gloves
  - If gown touches the floor, re-gowning required
  - Boots can be used to move items that fall on the floor
  - Do not kneel on the floor with bare gown

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- **Floor Contact**
  - Kneeling is acceptable as follows:
    - Place sterile bio-shield on the floor
    - When finished leave bio-shield on floor
    - Cover can be be picked up using forceps as long as the forceps are not used again

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- **Have You Evaluated This?**
  - Storage Racks

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- **Have You Evaluated This?**
  - Storage racks for rust

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- **Have You Evaluated This?**
  - Storage rack wheels

Understanding the Basis of Contamination Control

- **Have You Evaluated This?**
  - Items on storage racks

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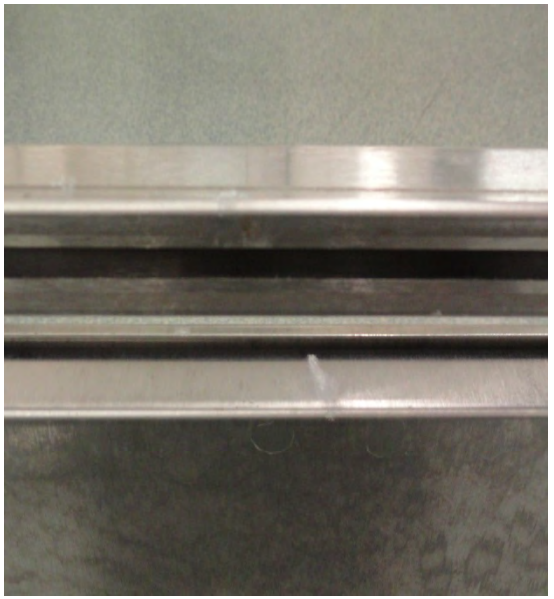
- **Have You Evaluated This?**
  - Stainless steel carts



Understanding the Basis of Contamination Control

- **Have You Evaluated This?**
  - Stainless steel carts

Understanding the Basis of Contamination Control

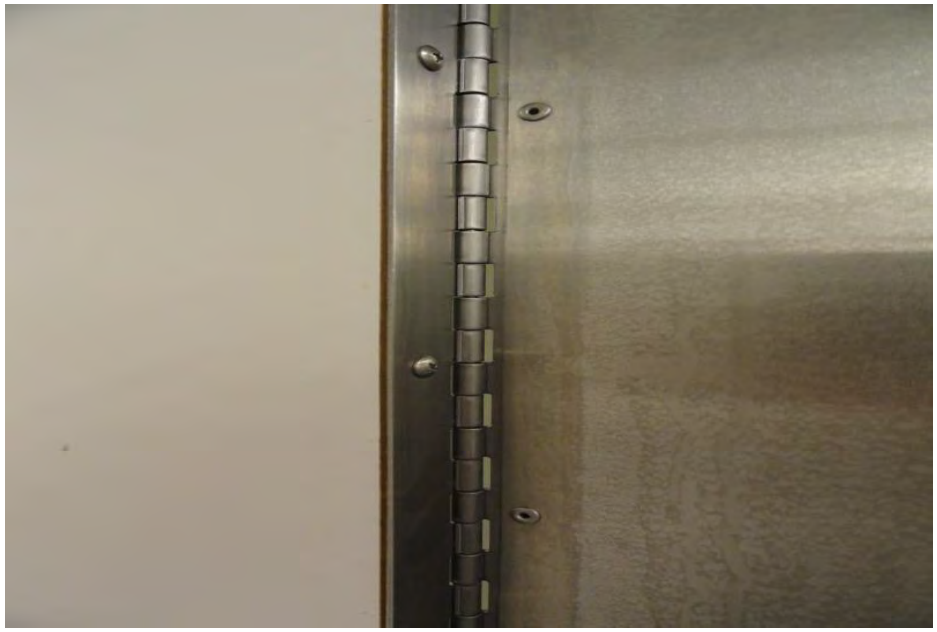
- **Have You Evaluated This?**
  - Items on the stainless steel carts

Understanding the Basis of Contamination Control

- **Have You Evaluated This?**
  - Touch less alcohol delivery system

Understanding the Basis of Contamination Control

- **Have You Evaluated This?**
  - Stainless steel hinges



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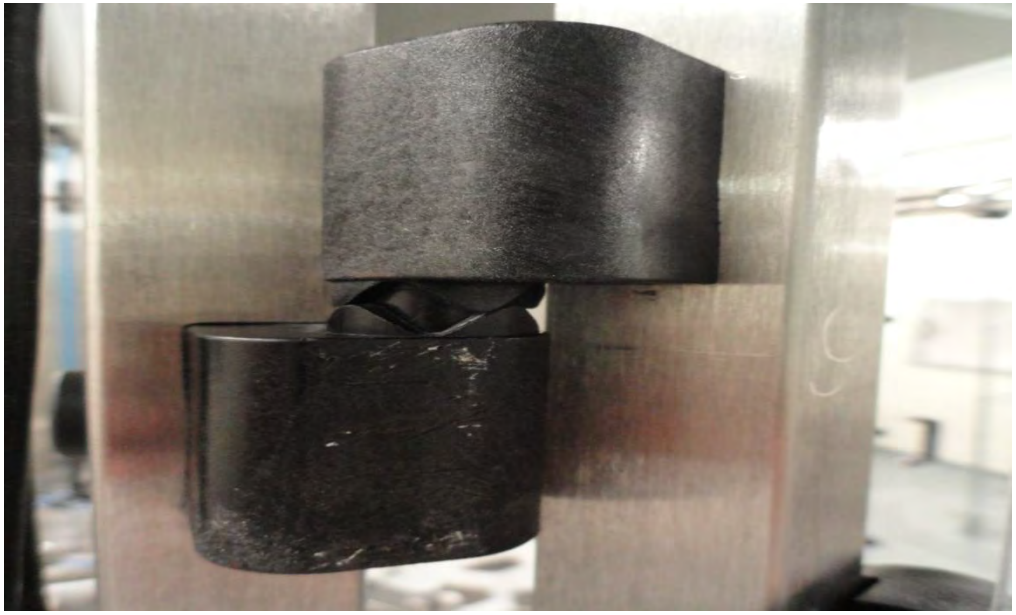
- **Have You Evaluated This?**
  - Non stainless steel hinges



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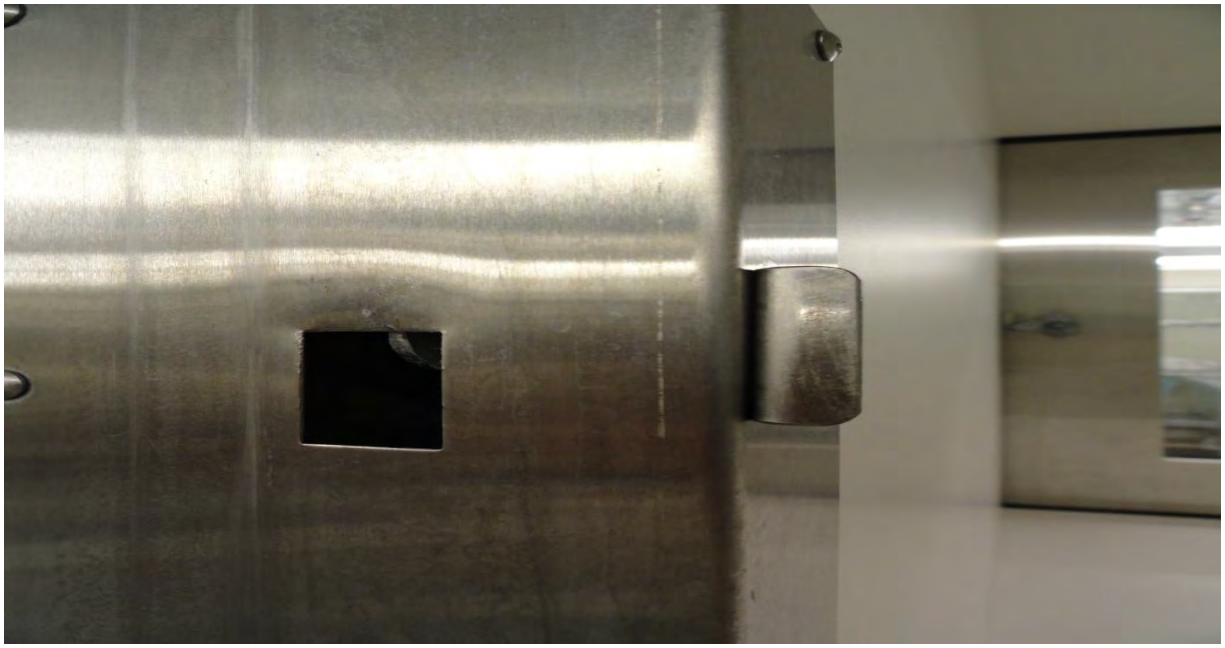
- **Have You Evaluated This?**
  - Pass through gaskets

Understanding the Basis of Contamination Control

- **Have You Evaluated This?**
  - Opening/holes for latch system



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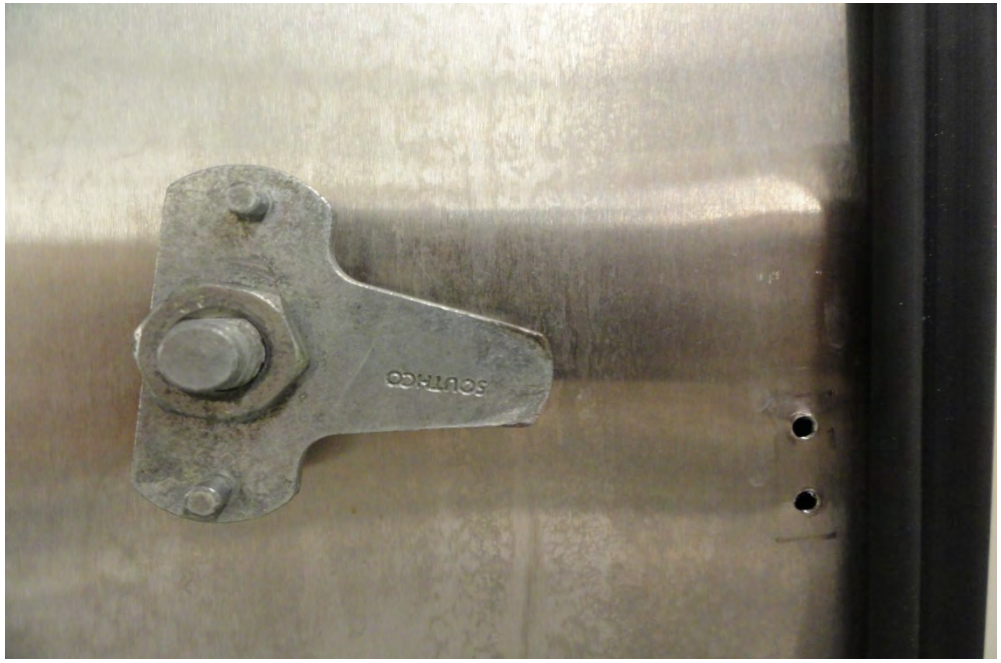

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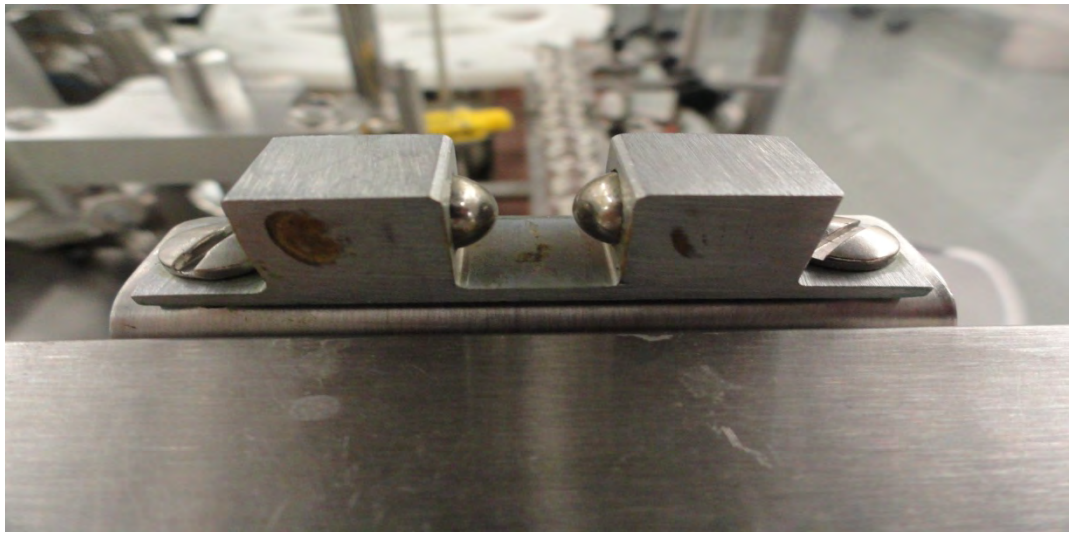
- **Have You Evaluated This?**
  - Spring loaded latch system



Understanding the Basis of Contamination Control

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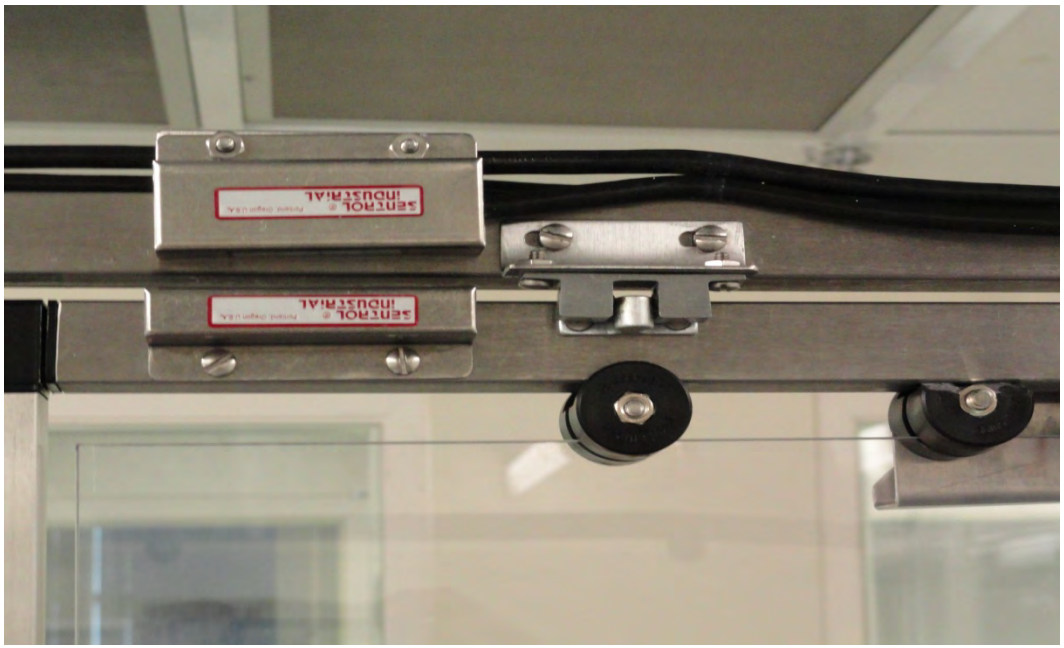

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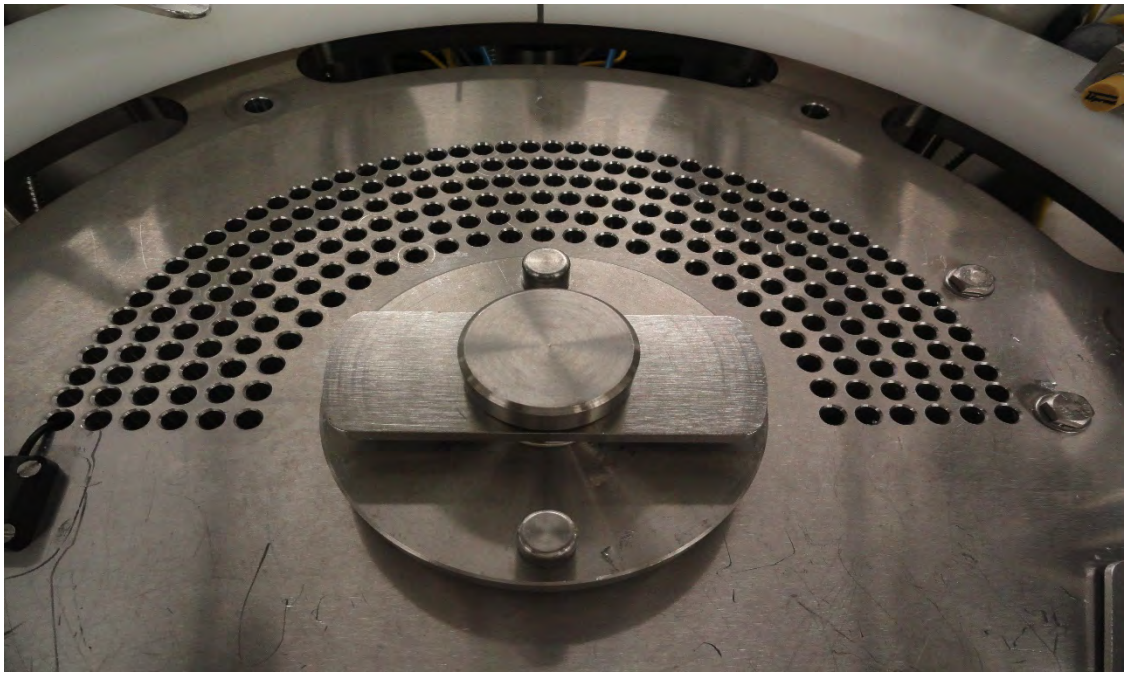
- **Have You Evaluated This?**
  - Sensor and latch is near open vials

Understanding the Basis of Contamination Control

- **Have You Evaluated This?**
  - Sensor and latch is near open vials

Understanding the Basis of Contamination Control

- **Have You Evaluated This?**
  - Extremely difficult to clean/sanitize



Understanding the Basis of Contamination Control

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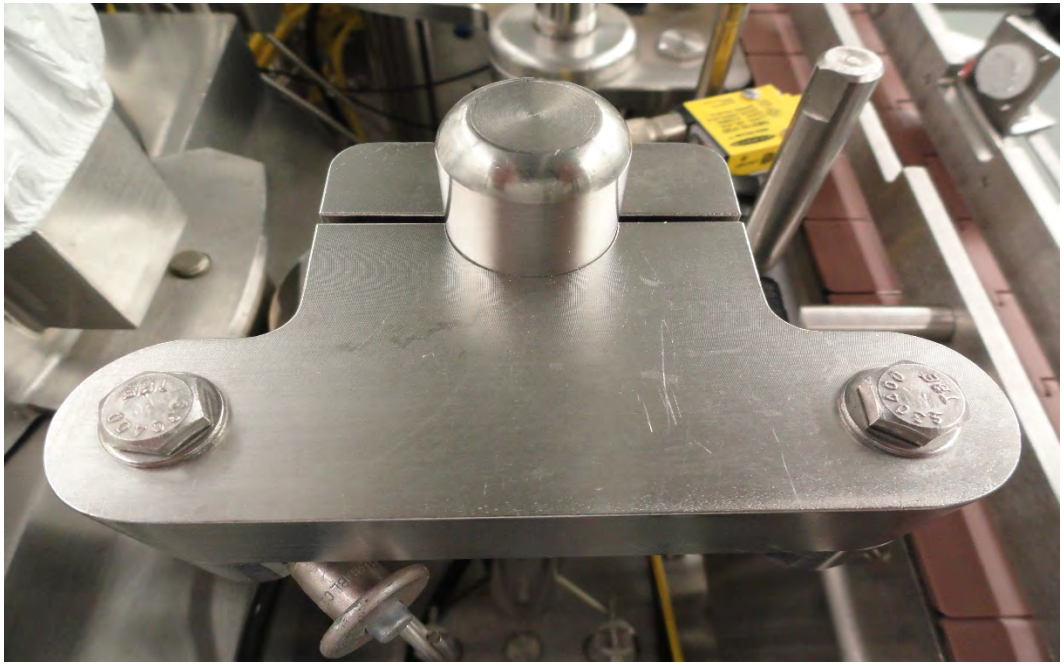

Understanding the Basis of Contamination Control

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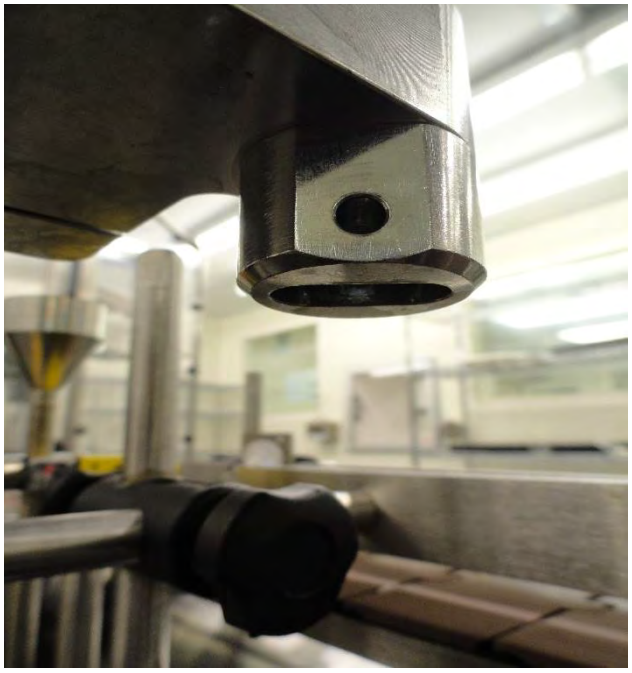

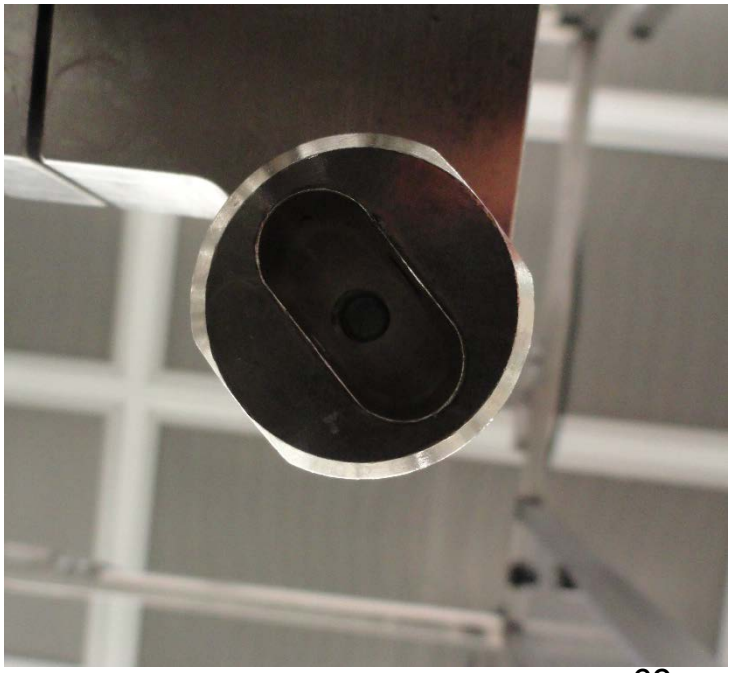

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- **Have You Evaluated This?**
  - Flat surfaces above vial height

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- **Have You Evaluated This?**
  - Location of lights

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- **Have You Evaluated This?**
  - Open door not under HEPA filter

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- **Have You Evaluated This?**
  - Rust/Rouge on manual crimper

Understanding the Basis of Contamination Control

- **Have You Evaluated This?**
  - Exposed piping and sprinkler dead

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- **Have You Evaluated This?**
  - Non-integral ceiling tile

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- **Have You Evaluated This?**
  - Underside of gowning bench

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- **Have You Evaluated This?**
  - Underside of tables

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- **Have You Evaluated This?**
  - Stickers/Labels on filling system

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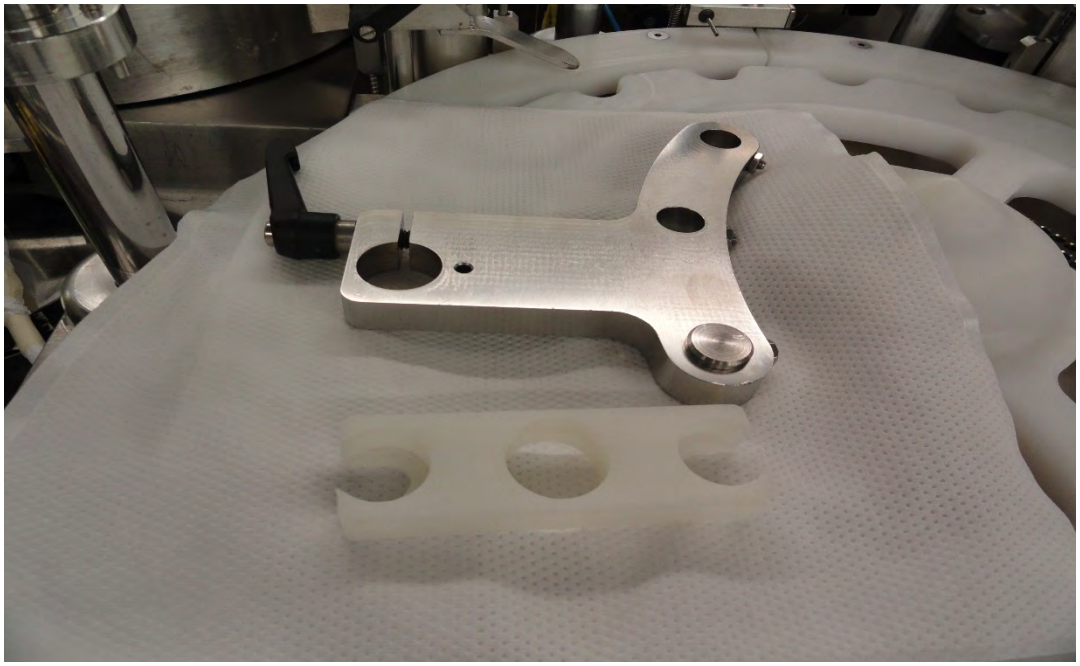
- **Have You Evaluated This?**
  - Difficult to clean, sanitize and sporicide

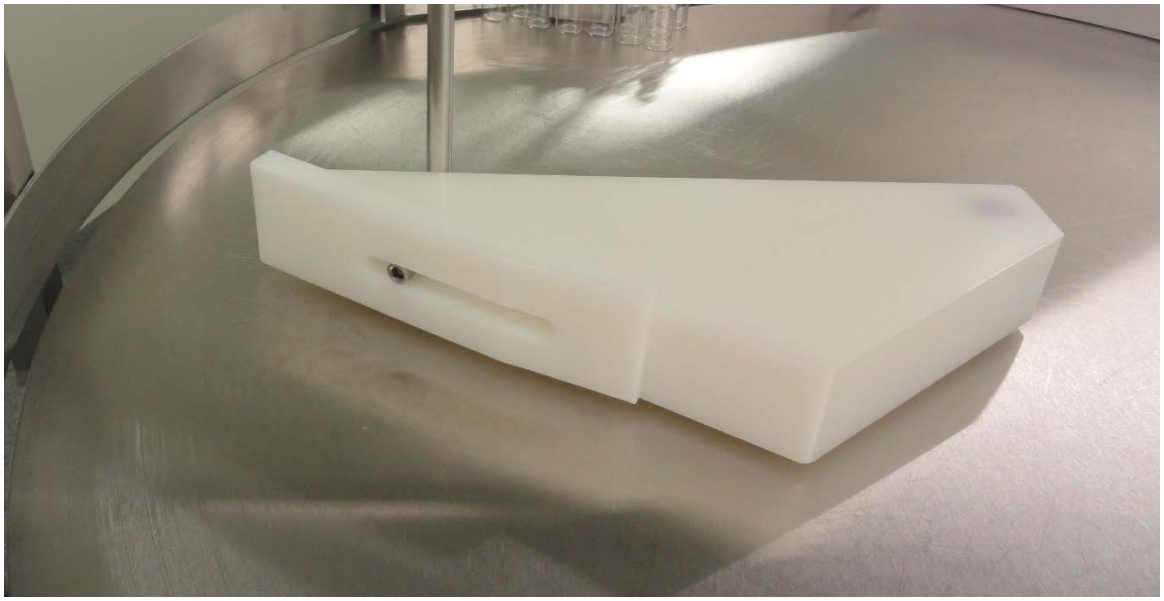
Understanding the Basis of Contamination Control

- **Have You Evaluated This?**
  - Difficult to clean, sanitize and sporicide



Understanding the Basis of Contamination Control

- **Have You Evaluated This?**
  - Difficult to clean, sanitize and sporicide



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- **Have You Evaluated This?**
  - Non stainless steel cart

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- **Have You Evaluated This?**
  - Grade-A cool down area for autoclave

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- **Have You Evaluated This?**
  - Pass through materials of construction

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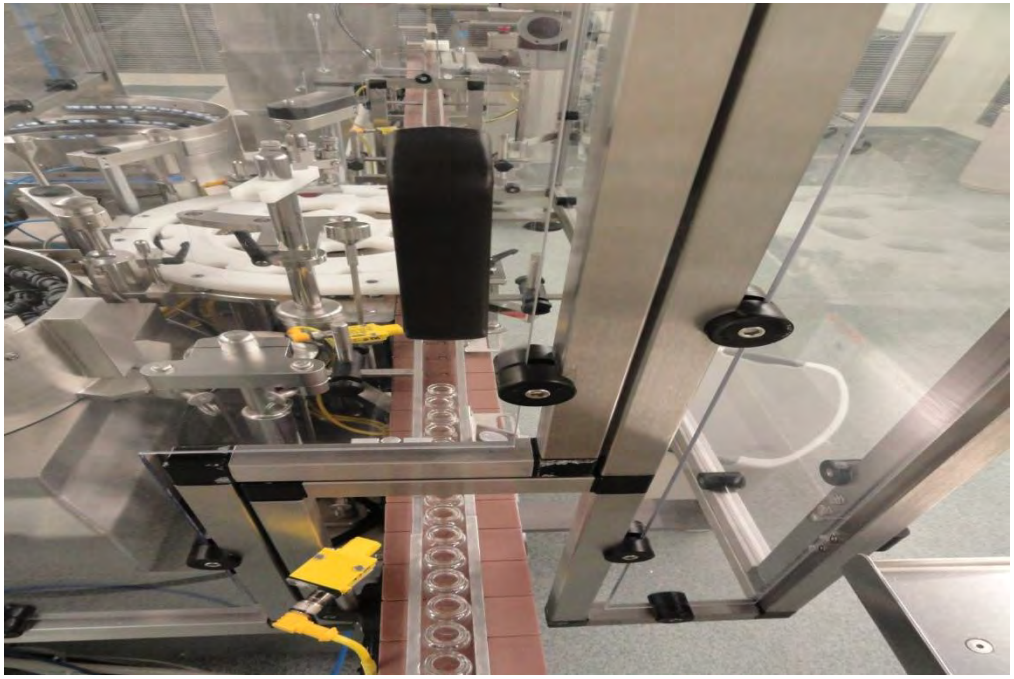
- **Have You Evaluated This?**
  - Design, door handle over all vials



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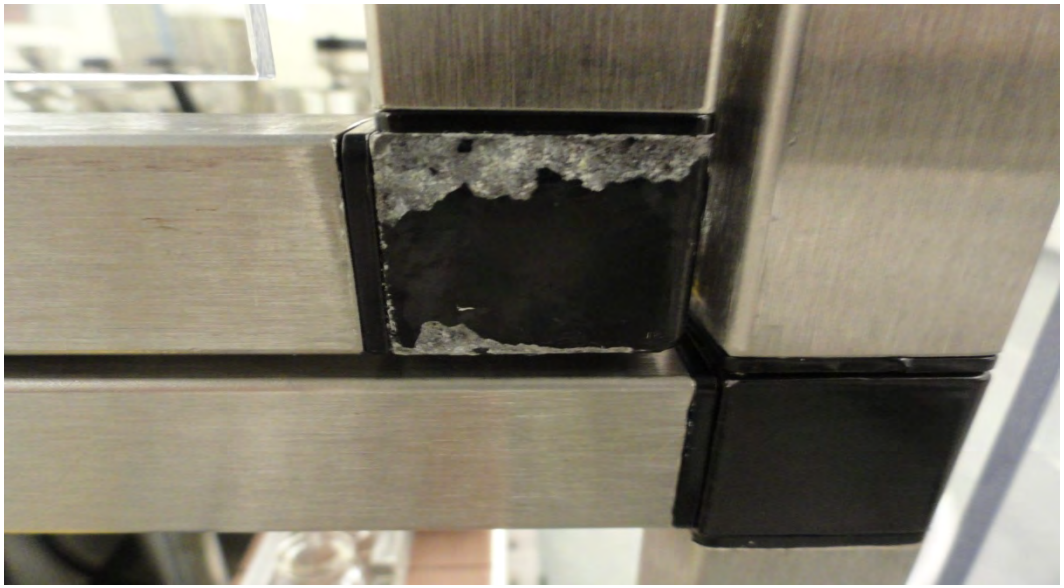
- **Have You Evaluated This?**
  - Chipping paint over critical areas



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- **Have You Evaluated This?**
  - Corrosion of materials

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- **Have You Evaluated This?**
  - Corrosion/Cracking of floor material

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- **Have You Evaluated This?**
  - Defect in the ceiling pannel

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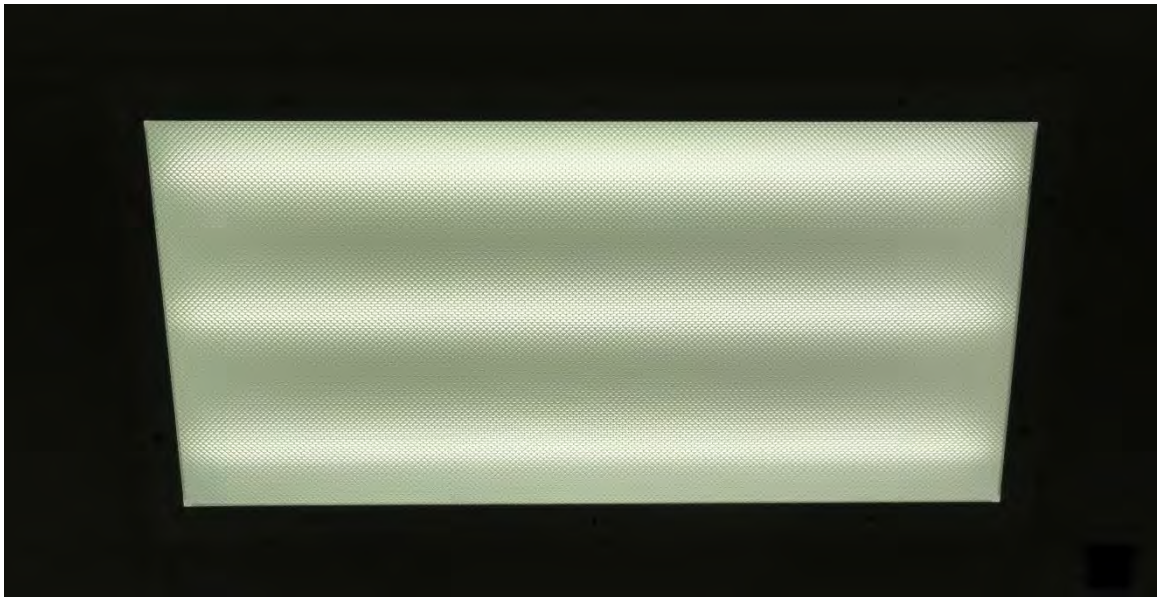
- **Have You Evaluated This?**
  - Foreign material above light cover. What's the likely hood it's bugs?



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- **Have You Evaluated This?**
  - Exterior tacky mat surface not removed

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- **Equipment Pass Thru/Airlock**
  - Upper and lower system

Understanding the Basis of Contamination Control

- **Equipment Pass Thru/Airlock**
  - Used for heat sensitive and electrical items that can not be autoclaved
  - Used for large items like carts and tanks
  - Confirm all surfaces are sanitized including the under sides and wheels
  - Use a cleaner/sanitizer (If visibly soiled), a sporicide and a wipe down with alcohol

Understanding the Basis of Contamination Control

- **Equipment Pass Thru/Airlock**
  - Environmental monitoring equipment usually enters into the processing areas
    - Equipment may be dedicated to an area
  - Confirm contact times are adhered to
  - Sterile wipes that are available
    - Sterile 70% alcohol
    - Sodium hypochlorite

Understanding the Basis of Contamination Control

- **Takeaway Message**
  - Ensure SOP's are in place to be compliant
  - What are the frequently isolated organisms
  - Are bacillus and mold a common organism?
  - Evaluate if corrective actions are effective