

# Isolator for Sterility test



# Aseptic handling

- Production method of sterile product
  - Terminal Sterilization / Aseptic processing
- Guideline of installation site
  - Production
    - All in the Classified room
      - Grade B : Clean booth, RABS
      - D or better : Isolator
  - Sterility test
    - Workstation(Grade B) or Isolator(CNC)

# Installation site of isolator

- Isolator for sterility testing
  - No formal requirement for classification
  - Access control: only to trained staff
- Isolator for aseptic production
  - Grade D or better
- Reference
  - PIC/S. ISOLATORS USED FOR ASEPTIC PROCESSING AND STERILITY TESTING

# Why Isolator?

- Less contamination rate
  - Reduce false positive
- Less EM cost and Less gowning
  - Grade D / CNC
- Less footprint
  - Small size

# Clean Room vs Isolator

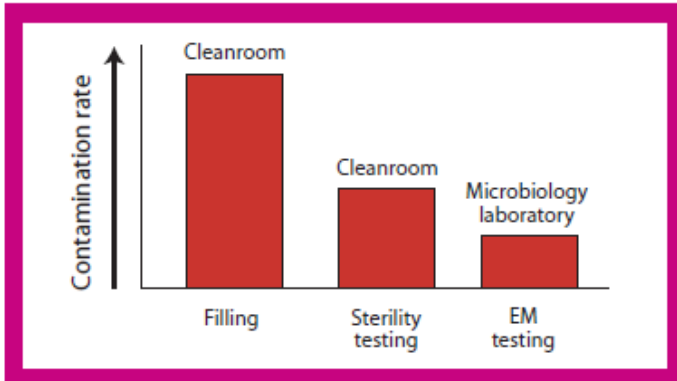


Figure 1: Relative contamination rates during the period when filling and sterility testing were conducted in cleanrooms (through ~1985).

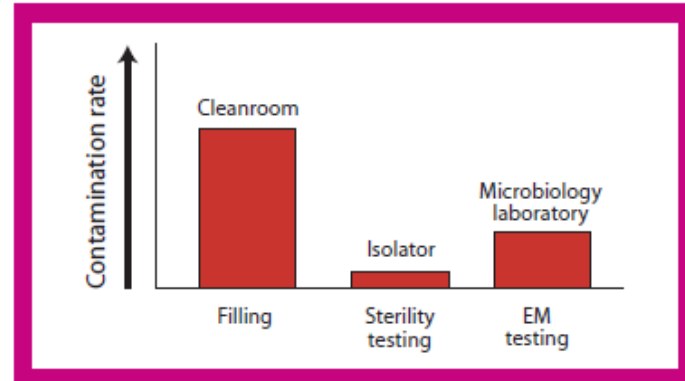


Figure 2: Relative contamination rates when sterility testing is conducted in an isolator.

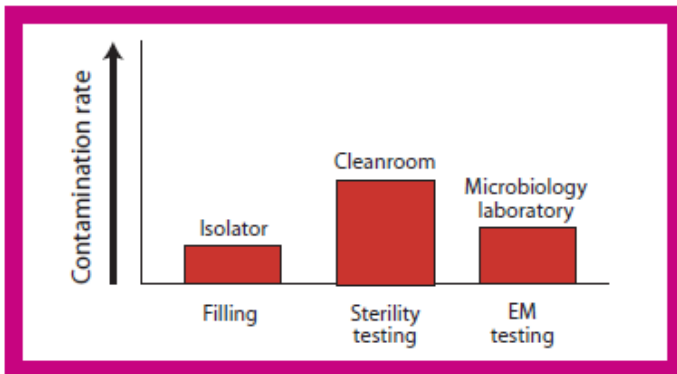


Figure 3: Relative contamination rates when filling is conducted in an isolator but testing is performed in a cleanroom.

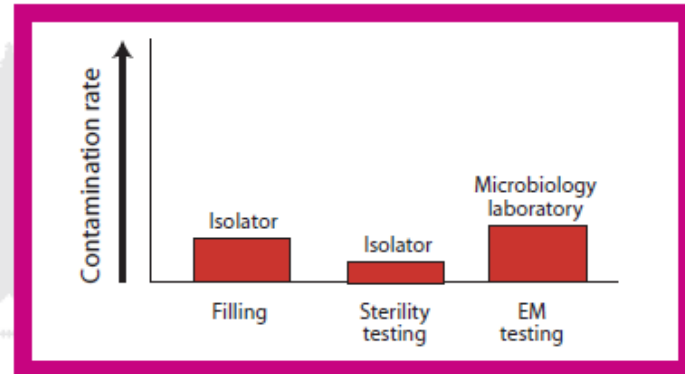


Figure 4: Relative contamination rates when isolators are used for both filling and testing.

Importance of Background Microbial Levels in the Manufacture and Testing of Sterile Products. James Agalloco

# Sterility test

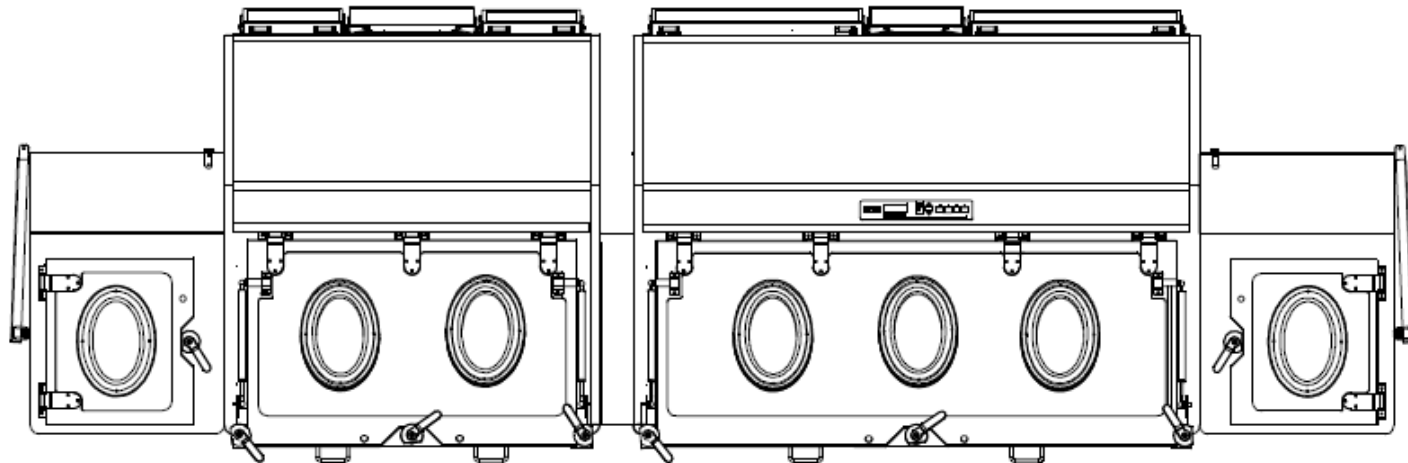
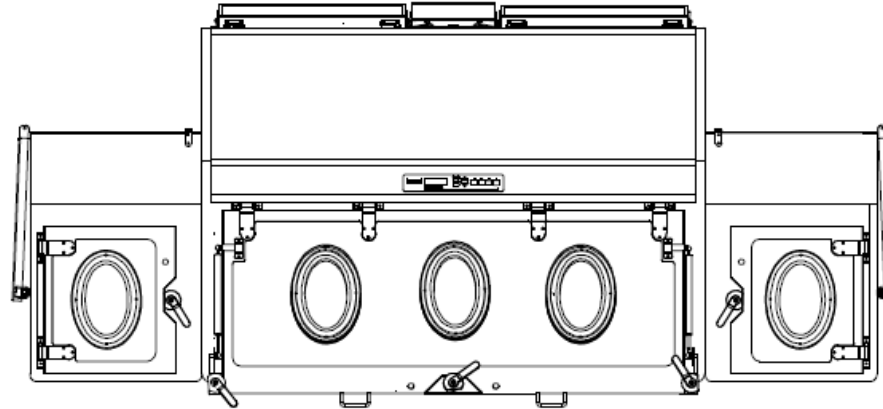
- USP <71 >
  - the last mandatory control to be performed on sterile drugs and ophthalmic products before their release
- Credibility of test
  - False positive
    - Add work, cost, delay of product release
  - False negative
    - Non sterile product in market. Significant results
- Method
  - Membrane filter / Direct

# Isolators: ESCO



<b>CHAMBER DIMENSIONS</b>			
<b>Chamber</b>	<b>Width (mm)</b>	<b>Depth (mm)</b>	<b>Height (mm)</b>
<b>Process Chamber</b>			
<b>2 Glove</b>	1200	670	790
<b>3 Glove</b>	1600	670	790
<b>4 Glove</b>	2000	670	790
<b>Pass Chamber</b>			
<b>1 Glove</b>	555	450	580
<b>Outer Opening</b>	380	NA	450
<b>Inner Opening</b>	300	NA	450

# Modular Size



# Specification I

- Interior
  - STS 316L: H<sub>2</sub>O<sub>2</sub> contact part
  - 3 mm thick, 0.4 Ra, 19 mm radius of corner
- Exterior
  - STS 304: H<sub>2</sub>O<sub>2</sub> non-contact part
- Visor door
  - Tilted. Safety glass.
  - Static or Inflatable seal
  - Glove port: Oval or Round

# Glass

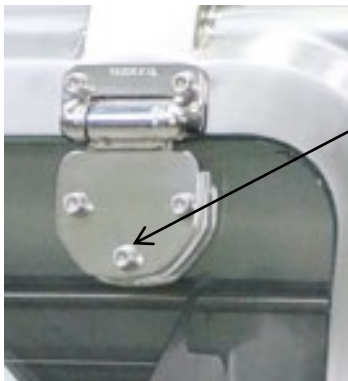
Toughened Safety Glass

Laminate

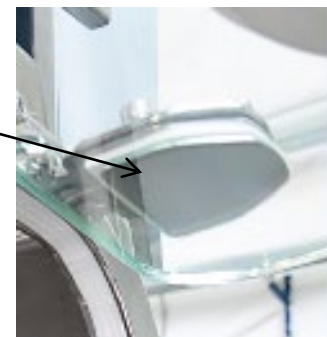
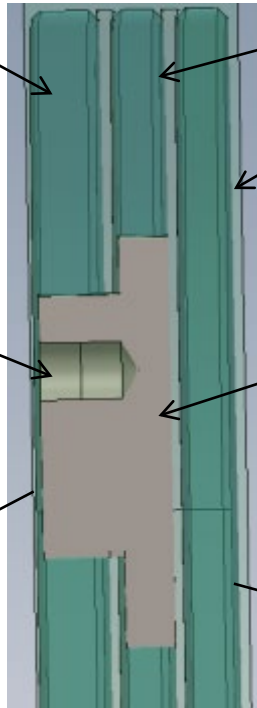
Flush Interior Surface

Threaded Blind Mounting Hole

Bonded in St. St. Mounts for Hinges, Handles & Gas Struts



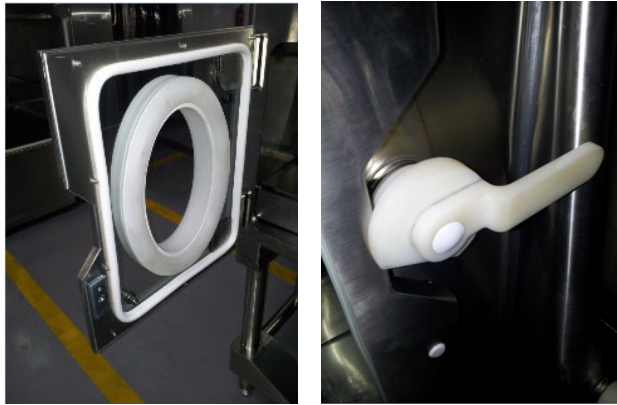
Outside View



Inside View

# Seals

- Static seals
  - with compression, latch provide pressure tight seal.
  - Less maintenance



- Inflatable seals
  - with air supply to gasket,
  - more reliable and give a better seal



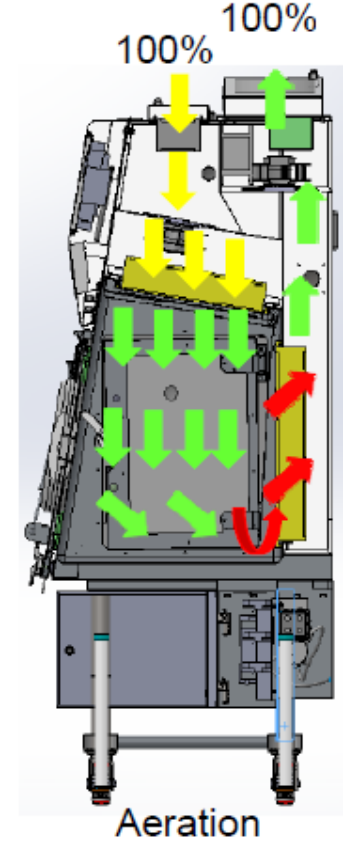
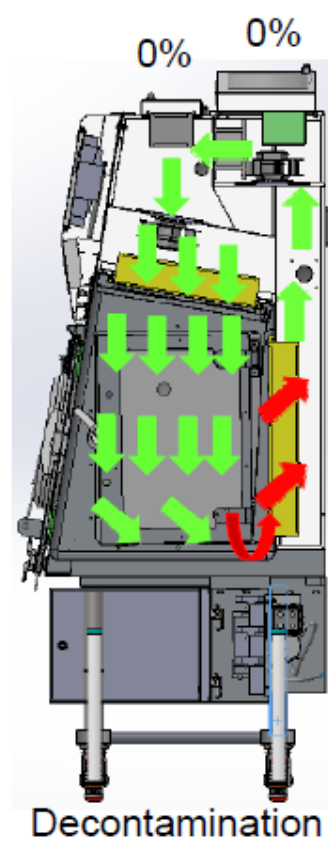
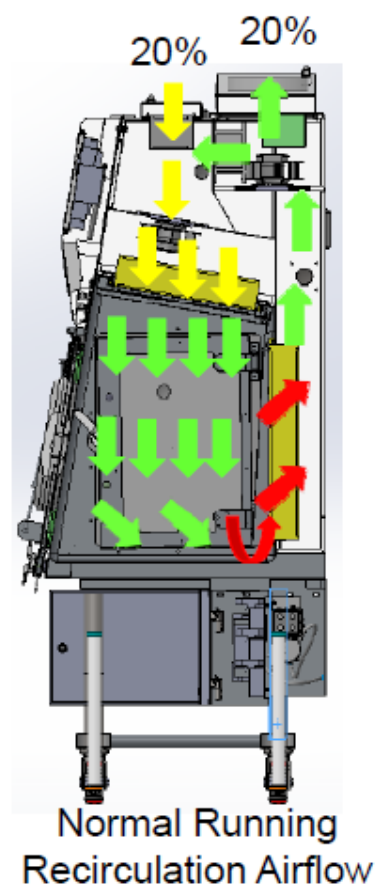
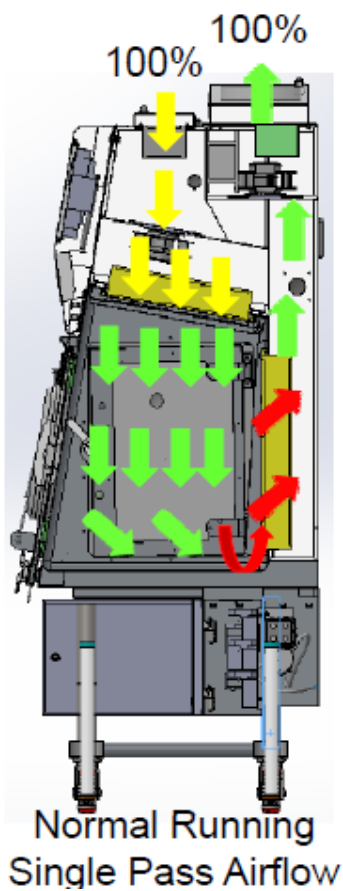
# Specification II

- Filters
  - Pre filter
  - Main filter
    - HEPA filter(H14) or ULPA filter(U15)
- Glove
  - Single piece / Separated: Glove and sleeve
  - Hypalon(Mtrl). Piercan(Mnf)
- HMI: Siemens
- Stand: Height adjustment / fixed height
- Others
  - Recorder, shelves

# Physical property

- Differential Pressure
  - Process chamber: +60Pa
  - Pass chamber: +35Pa
  - Negative pressure possible(toxic material)
- Airflow
  - Unidirectional 0.45 m/s
  - Grade A aseptic environment
  - re-circulatory or single pass

# Airflow configurations



Room Air



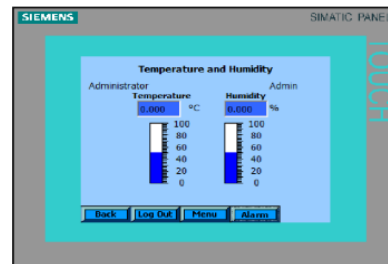
Filtered Air



Contaminated Air

# Integrity and Monitoring

- Pressure hold testing(Chamber integrity)
  - Automatic / Manual
  - Procedure
    - Initial : 280 Pa, Start: 250 Pa, Test time: 5 min
    - Acceptance criteria: 42 Pa
- Monitoring(Not controlled)
  - Temperature and humidity



# Security

- Can be set on HMI
  - 4 levels
    - Administrator, Maintenance, Supervisor, Operator
- Alarm history
  - Cleared by Administrator
  - Acknowledged by Supervisor, Maintenance, Administrator

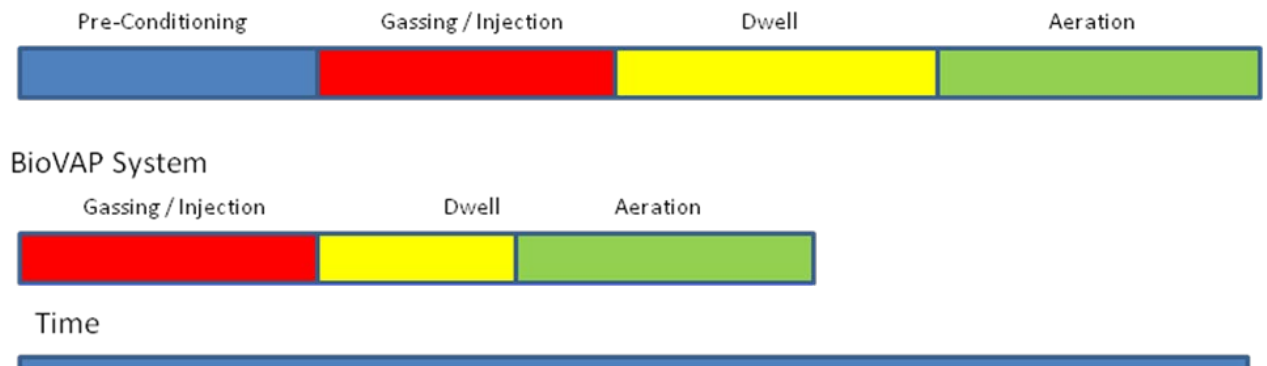
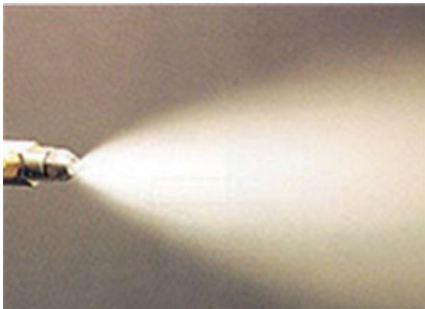
# Decontamination

- Biovap
  - Manufacturer: ESCO
  - Chemical: H<sub>2</sub>O<sub>2</sub>
  - Integrated, automatic
  - Less than 60 min.
  - Independent main/pass chamber



# BioVAP

- Sterilizing agent: H<sub>2</sub>O<sub>2</sub> solution
  - Dry fog (<10 um particle)
- Merits: Short cycle time
  - No-need to preconditioning (Humidity)
- Procedure
  - Inject chamber thru fine atomizer nozzle (Dry fog)
  - Wait until dwell time over and aeration



# Utility

- Power
  - 220V or 380V
- Compressed air
  - Minimum 2 Bar
  - On-board compressor possible
- Duct
  - 10 inch. PVC flexible duct
  - Catalytic convertor possible
    - No worry about room differential pressure problem

# Options

- Sterility pump integration
  - Sartorius/Millipore
- Glove extender, Glove leak tester
- Particle counter
- Air sampler
- H<sub>2</sub>O<sub>2</sub> sensor
  - Hi, Low. Draeger
- Others
  - Airflow sensor
  - RTP(Rapid Transfer Port)
    - Alpha port, beta part(liner, liquid handling)



# Verification

- FAT
  - Mechanical hardware checks
  - EC&I(Electrical component and Indicator)
  - Calibration check
  - Gas Cycle Development(option)
- IQ/OQ
  - Hardware check
  - Software verification
  - Performance check
    - Airflow, pressure, functional/operational
  - GCD using CI and BI.
- PQ
  - User scope but can be supported by YB

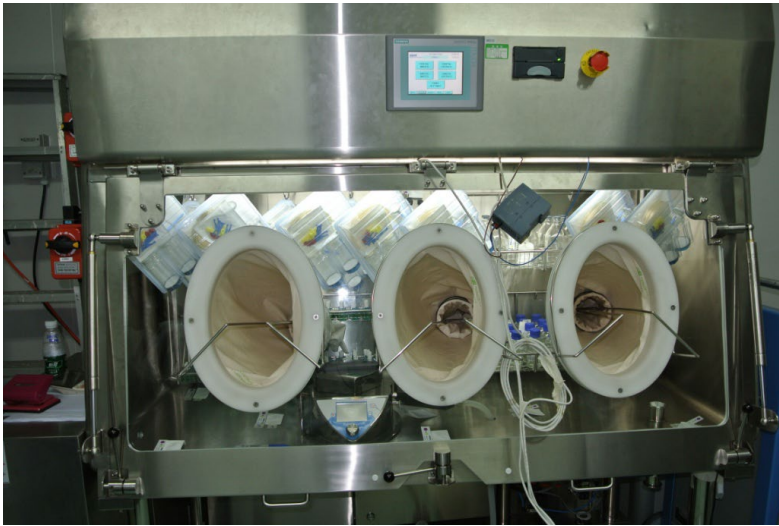
# Maintenance

- PM(Preventive Maintenance) contract
  - Visual inspection
  - Check pressure hold integrity
  - Calibration of instrumentation
  - Filter integrity verification
  - Equipment functionality
  - Replacement part excluded


# Strength of YB Co Kr

- 전문성: Expert
  - Global 제품을 영업, 설치, 검증
    - SKAN. ESCO 생산용 isolator 외
  - Isolator 와 관련된 제품 취급
    - Containment systems
      - BSC, Down Flow Booth, Ventilated Balance Enclosure
    - RTP: liquid transfer(SK케미칼), PE container 외
    - 훈증: 과산화수소 룸 훈증, 장비판매, 검증.
- 유연성: Flexibility
  - 고객의 요구에 맞게 제안

# Photos





 **Your Best  
Laboratory**

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