

Bio Safety Cabinet



ESCO



 **Your Best
Laboratory**

Introduction

- Why Biological Safety Cabinet
 - When you handle Biohazard sample, you could be exposed to Laboratory Associated Infections(LAIs).
 - For your safety, CDC recommends use of BSC according to Bio Safety Level.

Ref: Biosafety in Microbiological and Biomedical Laboratories. CDC

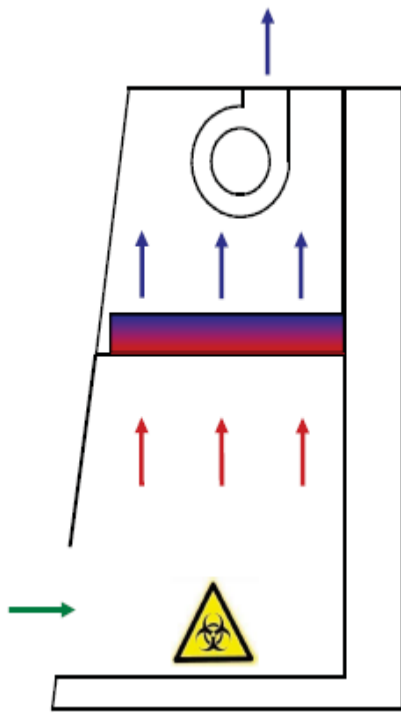
Bio Safety Level

	Lethality	Medium	Cure	Example
1	Safe	Liquid	Yes	B.Subtilis
2	Some	Liquid	Some	HIV
3	Serious	Airborne	Some	TBC
4	Extreme	Airborne	None	Ebola

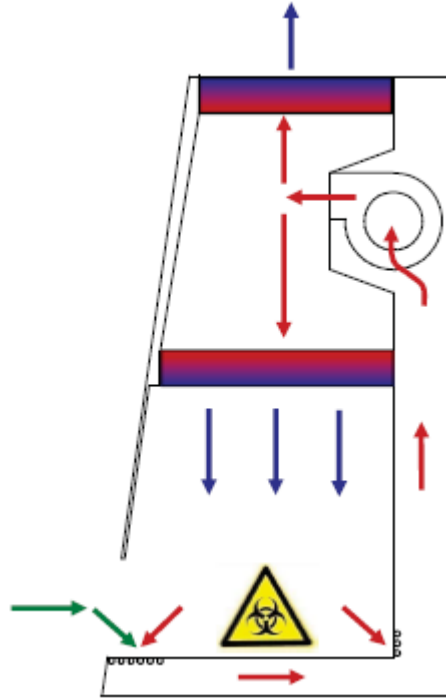
Classification of BSC

Class	Min Inflow Velocity (fpm)	Recirc. Air	Exhaust Air	Contaminated Plenum Surrounded by	Exhaust Alternatives	Biosafety Level
I	75	0%	100%	Outside air (Lab room)	Inside room / Hard Duct	1,2,3
II A1	75	70%	30%	Outside air (Lab room)	Inside room / Thimble Duct	1,2,3
II A2	100	70%	30%	Negative pressure	Inside room / Thimble Duct	1,2,3
II B1	100	30%	70%	Negative pressure	Hard duct only	1,2,3
II B2	100	0%	100%	Negative pressure	Hard duct only	1,2,3
III	Closed P>0.5"WG	0%	100%	Negative pressure	Inside room / Hard Duct	1,2,3,4

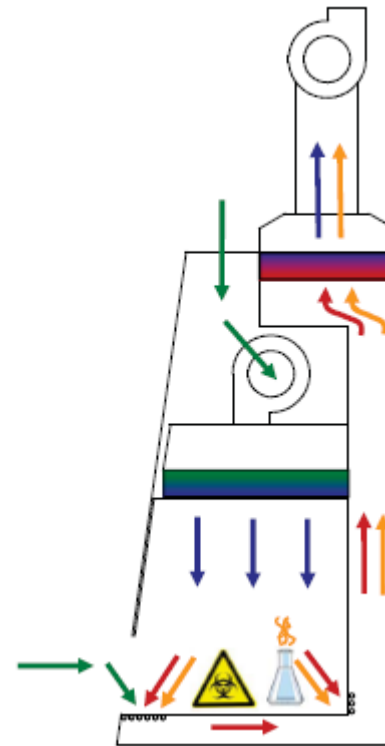
BSC class



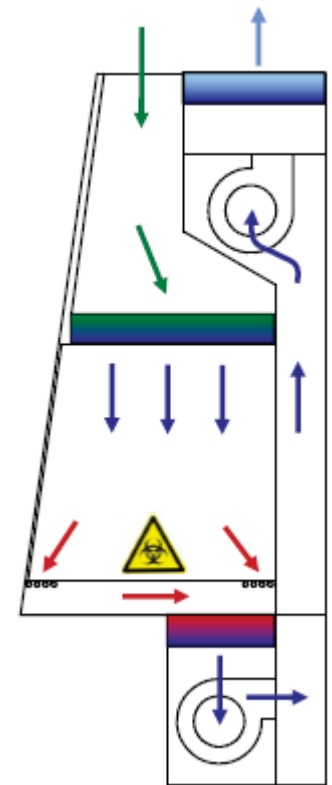
Class I



Class II A2



Class II B2



Class III

Recommendation

Table 1. Selection of a Safety Cabinet through Risk Assessment

Biological Risk Assessed	Protection Provided			BSC Class
	Personnel	Product	Environmental	
BSL 1 – 3	Yes	No	Yes	I
BSL 1 – 3	Yes	Yes	Yes	II (A1, A2, B1, B2)
BSL – 4	Yes	Yes	Yes	III; II—When used in suit room with suit

Ref: Biosafety in Microbiological and Biomedical Laboratories. CDC

International Guideline

- Major standards: EN 12469, NSF 49

	NSF 49	EN 12469
Inflow(m/s)	0.51 (100 ft/min)	0.4
Downflow(m/s)	None (Refer to manufacturer spec.)	0.25 – 0.5

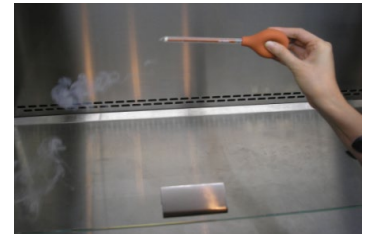
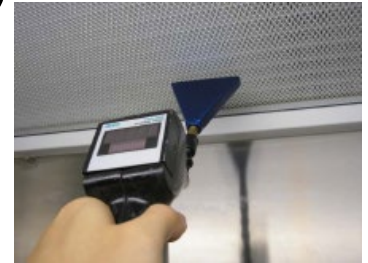
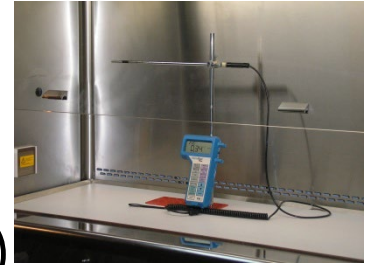
- FAQ: 0.45 m/s of downflow velocity?
 - When aseptic production of filling, connection
 - When you handle Biohazard sample, safety guideline is more important for your safety.

Components of general BSC

- Material of Construction(MOC)
 - Interior: STS 304, Exterior: Painted Steel
 - Sash: Glass
- Air filter
 - HEPA/ULPA
- Blower
 - AC / DC motor
- Sensor
 - Airflow sensor / Manometer
- Others
 - Stand, Suction valve, Electric outlet

Qualification of BSC

- Major
 - Site installation assessment(alarm test)
 - Airflow velocity: Inflow/Down flow
 - HEPA filter leak test
 - Smoke patterns test
- Optional
 - Non-viable / Viable Particle count
 - Recovery test
 - Light intensity, Sound emission, Vibration, Electric leakage



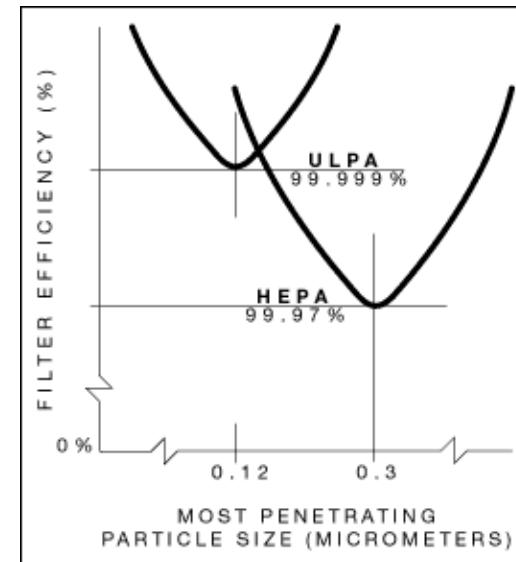
ESCO BSC

- NSF certified: Airstream, Labculture
- EN certified: Streamline



Features-Air Filter

- ULPA filter: Mini-pleat, Separatorless
 - More efficient (ISO Class 3)
 - Prolong filter life
 - Minimize leak, moisture resistant

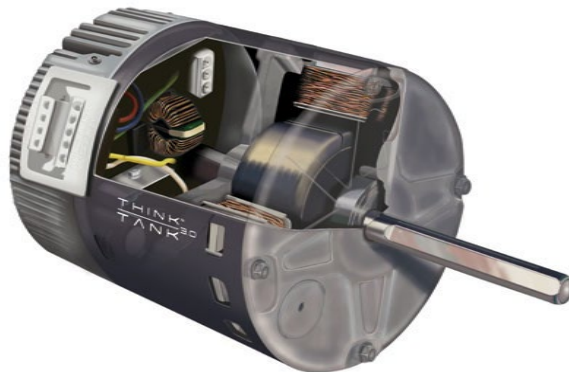


**99.999% at 0.1 to 0.3 micron, ULPA as per IEST-RP-CC001.3 USA*

**99.999% at MPPS, H14 as per EN 1822 EU*

Features-Energy Saving

- ECM Blower: Airstream, Labculture
 - Low energy consumption, low noise
 - Night set back mode
 - When you use 24 hr/day



1/3

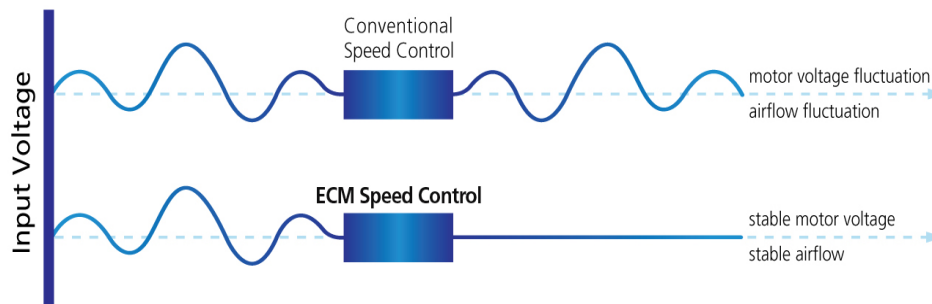
Energy of AC Blower



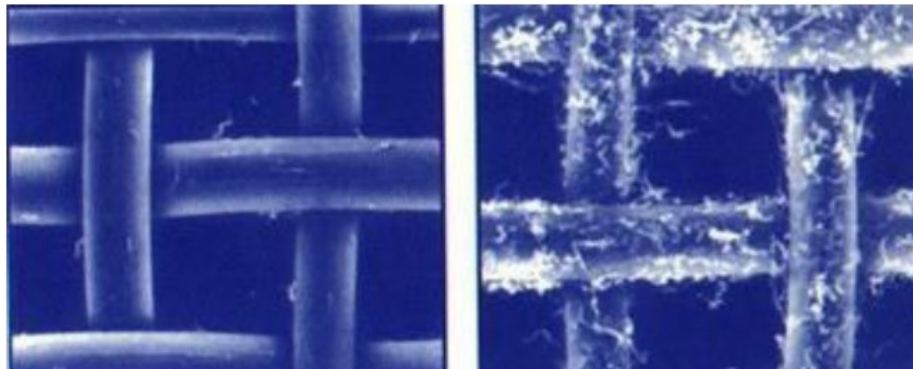
Features-Stable airflow

- Stable against input voltage: ECM Blower

Esco ECM Speed Control Microprocessor-Based Speed Controller



- Stable against filter clog: ECM Blower

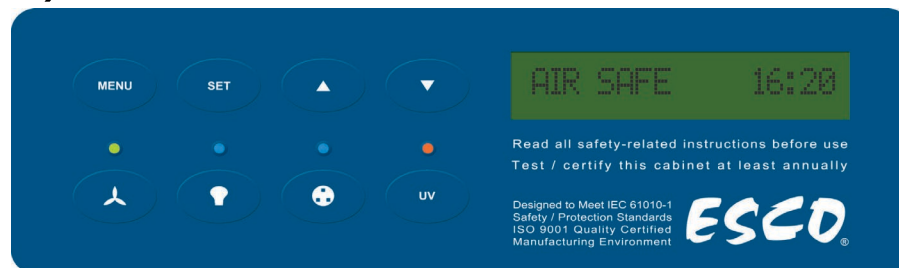


Features- Display

- Touchscreen: Airstream, Labculture



- LCD(Silver): Streamline



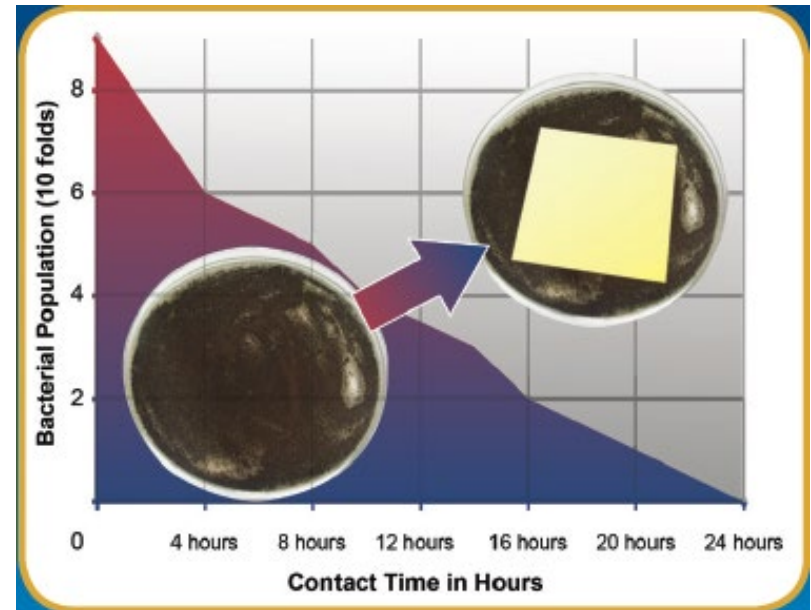
Features-Interior

- Single piece STS 304
- Round corner(No welding)
- Contain spillage



Features-Exterior

- Anti-Microbial Coating

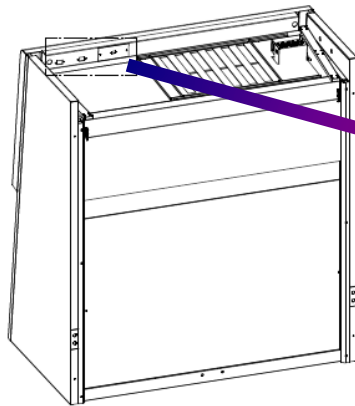


Features-Data transfer

- USB for BMS: Airstream, Labculture

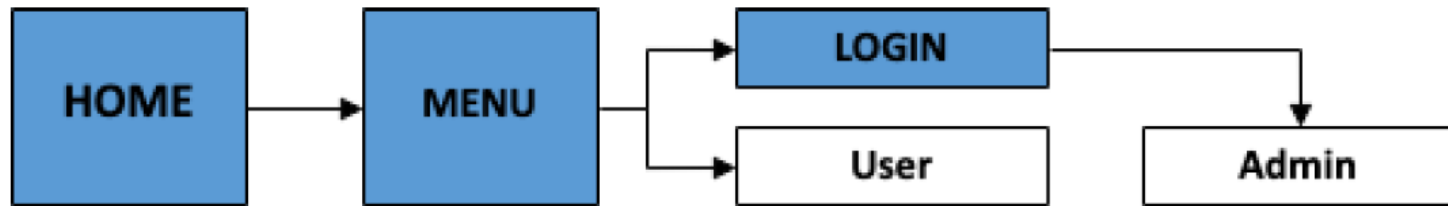


- RS-232 for BMS: Streamline



Features-Log in

- Standard: User, Admin
 - Quick start mode
 - Set critical parameter



- Advanced: 21 CFR part 11 option

Specification

Model	Labculture	Airstream	Streamline
Certification	NSF	NSF	EN
Model #	LA2-*S8 G4	AC2-*S8 G4	SC2-*S3
Width	3,4,5,6 ft	2,3,4,5,6 ft	4, 6 ft
D x H mm	625 x 720	610 x 660	580 x 670
Main filter	ULPA/HEPA	ULPA/HEPA	ULPA/HEPA
Exhaust filter	ULPA/HEPA	ULPA/HEPA	ULPA/HEPA
Option	B2 model: BIBO possible	Side wall glass	Side wall glass

Maintenance

- UV lamp
 - Once a year
- FL lamp
 - Once 2 year
- ULPA filter
 - 2~3 years depending on situations
 - Change according to your SOP
- Re-Qualification
 - At least annually
 - When major change: Filter replacement, Relocation

Merits of ESCO BSC

- Reference in Korea
 - SBL, SBE, GC, CKD, Dong-A, Celltrion, etc
- Service
 - Enough full-time service engineer
 - Humble: common part available. UV, FL.
- Validation team
 - Certified by NSF Field Certifier



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