Welcome to Beth-El Industries



ACES SEMINAR

An Overview of Advanced Quality Filters and Filtration Systems

Presented by Samuel Koeger

June 23, 2015

Introduction

Samuel Koeger

- Mechanical Engineer
- Technical Director
- Before positions in R&D, Sales & Marketing
- Member of Israeli Standard Committees
  - SI 4570 – Collective CBRN protection systems
  - SI 5455 – CBRN protection chambers
  - SI 4577 – Air tightness testing of protection rooms
  - SI 5451 – emergency toilets for use in protection rooms
- Holder of 7 Patents (air filtration)

Agenda

- Company introduction
- Types of filters, filter rating and applications
- Testing standards and methods
- Importance of BiBo filtration systems
- BiBo isolation and decontamination
- Space friendly design
- Q & A

Beth-El Zikhron Yaaqov Industries Ltd.
Corporate Headquarters, Systems & Parts Production, Food & Natural Products Production

Shachak Tec
Metal Processing and Plastic Injection Moulding

FILT-AIR
Particle Filtration and Ionization Technologies

Beth-El Food
Aunt Berta's Jams, Preserves, and Chocolates

B.E. Machinery
Design and Manufacturing of Production-lines

Gilboa Tooling Industries
Aerospace Precision Machining and Mould-making








Who We Are

- Beth-El is a market leader for air filtration solutions and provides high quality filtration products to customers in Israel and worldwide
- Beth-El is developing new filtration solutions for our global customers

Facts about Beth-El Industries:

- Experience of more than **40 years** in the design, development and manufacturing of air treatment systems
- **Largest company** in the field of collective protection (> 1000 employees
- Supply source of NBC-protection systems to **68 armies; 80 countries** altogether (civilian & military)
- **War proven** with ten-thousands of systems
- Production capacity of **thousands of systems / month**
- All Technologies **In-House**
- AQAP-2110, ISO 9001, AS 9100, MANHAR LEVEL A certified

Our Company Advantages

- Customer Support
- Product Quality
- Highest Product Performance
- Short Delivery Times
- Customization

All Technologies “In-House”

- Design and Engineering
- Development and Product Testing
- Filtration and Separation Technologies
- Metal processing
- Plastic Injection
- Aluminum die casting
- Precision machining
- Electronics and Programming
- Assembly and Testing

Manufacturing Facilities









Beth-El Industries



Manufacturer air filtration products for:

- Bomb Shelters



FA-Systems
FAH-Systems



- Buildings



CW-Filters



- Mobile Isolations and Surgery Tents



IsoArk (negative p.)
SteriTent (positive p.)

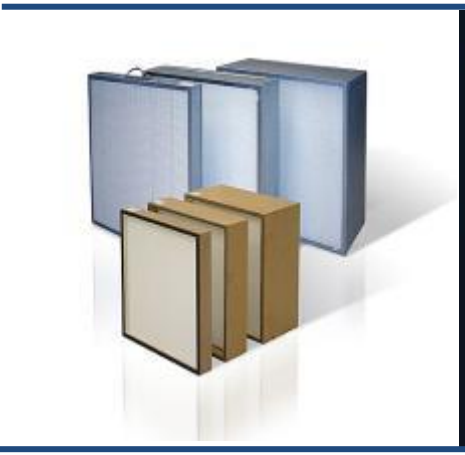
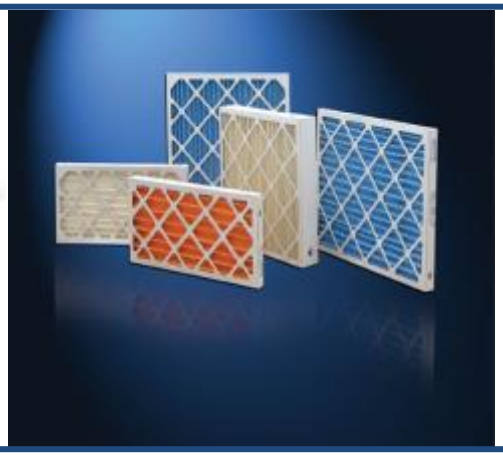


Our Products

- Air Filters, for all applications
- Bag-in / Bag-out (Safe Change) units
- Fan Filter Units
- Laminar, biological and chemical hoods
- Air Ionizer to generate healthy air in closed rooms and disinfect the air from bacteria and viruses

Types of filters, filter rating and applications

Beth-El Industries



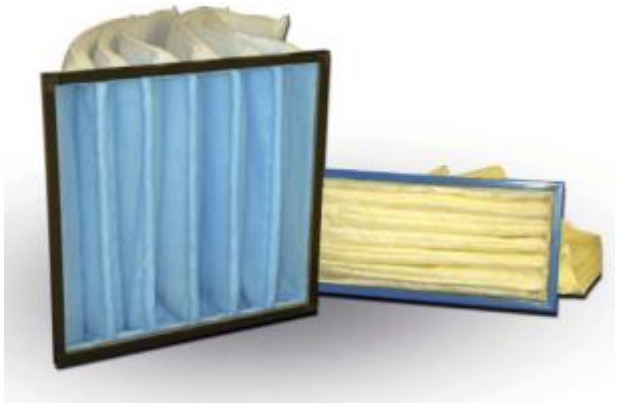
Product Line

- Fine Dust Filter
- Final Filter for Fan Filter Units
- Final Filter for Clean Rooms
- Final Filter for Channel Installation
- High Active Filter Surface - Low Pressure Drop
- Final Filter for Grid Systems

Fine Dust Filters

G90/G80/GV8 and Series







Primary and secondary filters

Efficiency from G3 – F9

HEPA / ULPA Filters

Filter Types for Clean Rooms





GP Type



GT Type



HT Type

PANEL FINEDUST / HEPA / ULPA FILTER - TYPE GP



ALUMINIUM FRAME

F6 – U17
EFFICIENCIES

(60% - 99.999995%)

COMPACT HEPA / ULPA FILTER

TYPE GW

F6 – U15 (60% - 99.9995%)

EFFICIENCIES

High Airflow Filter



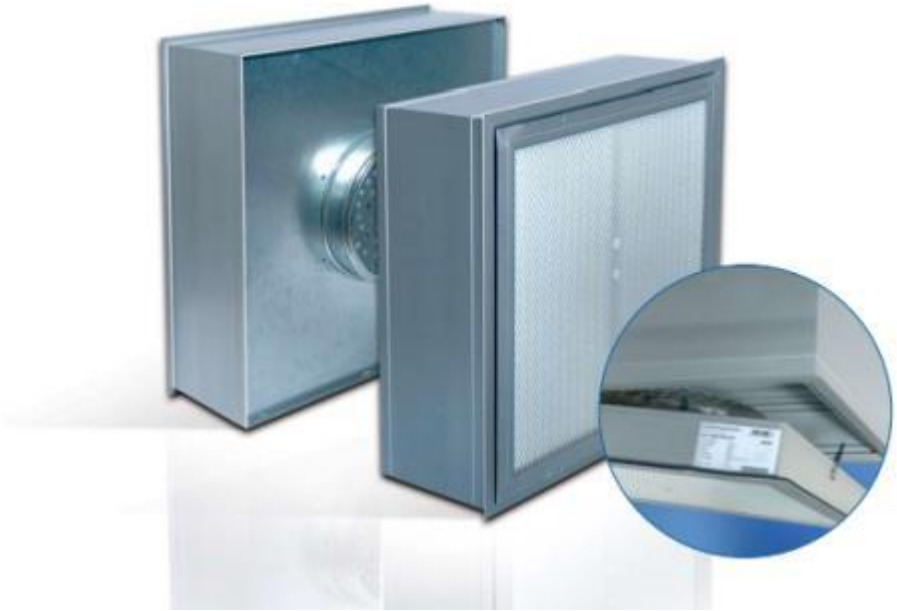
TERMINAL HEPA / ULPA FILTER

TYPE GT



F8 – U17 (90% - 99.999995%) EFFICIENCIES

CEILING FILTER



Terminal Housing with Inserted HEPA Filters

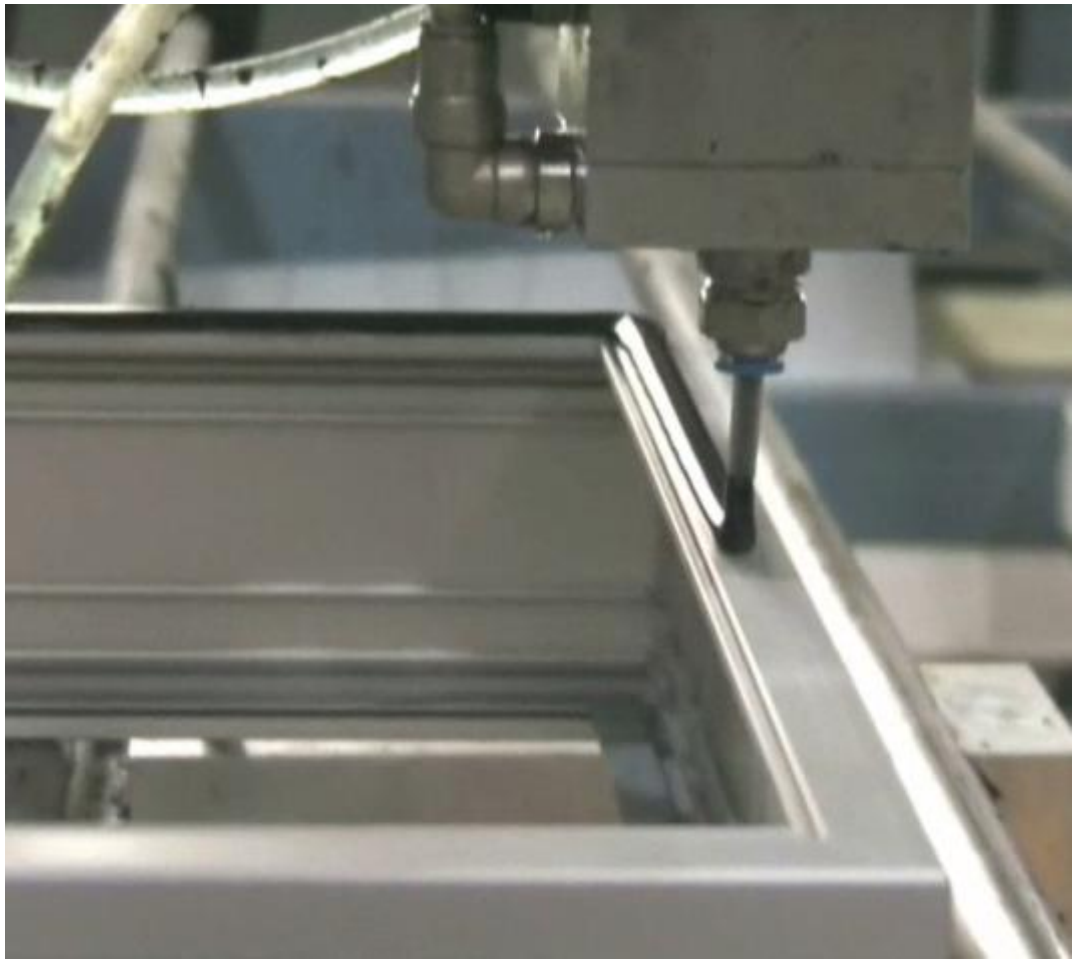
Advantages of Beth-El filters

- Highest performance - high airflow with low pressure drop
- Unique pleating technology
- Very high quality - **ALL** final filters are tested after production
- Cost effective solutions – due to high automation

Automated Plant



Automated Plant



Automated Plant

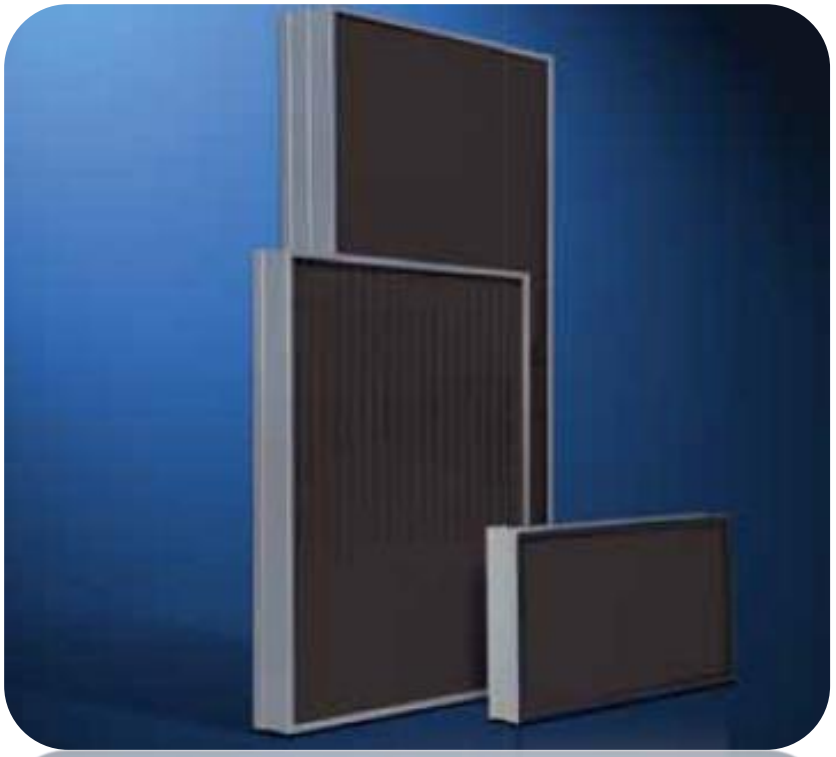


Commercial Carbon Filters

PANEL

CARBON FILTER - TYPE CP

ALUMINIUM FRAME



V-Bank

CARBON FILTER - TYPE CV and CP

Plastic / Metal Frame



Conical & Cylindrical Filters for Gas Turbines

Fine dust filter TYPE GRV / GRO

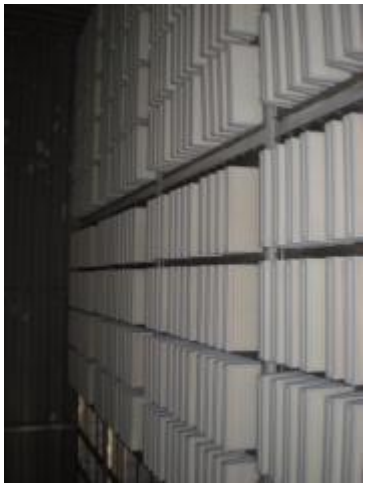


Gas turbine Filter Projects



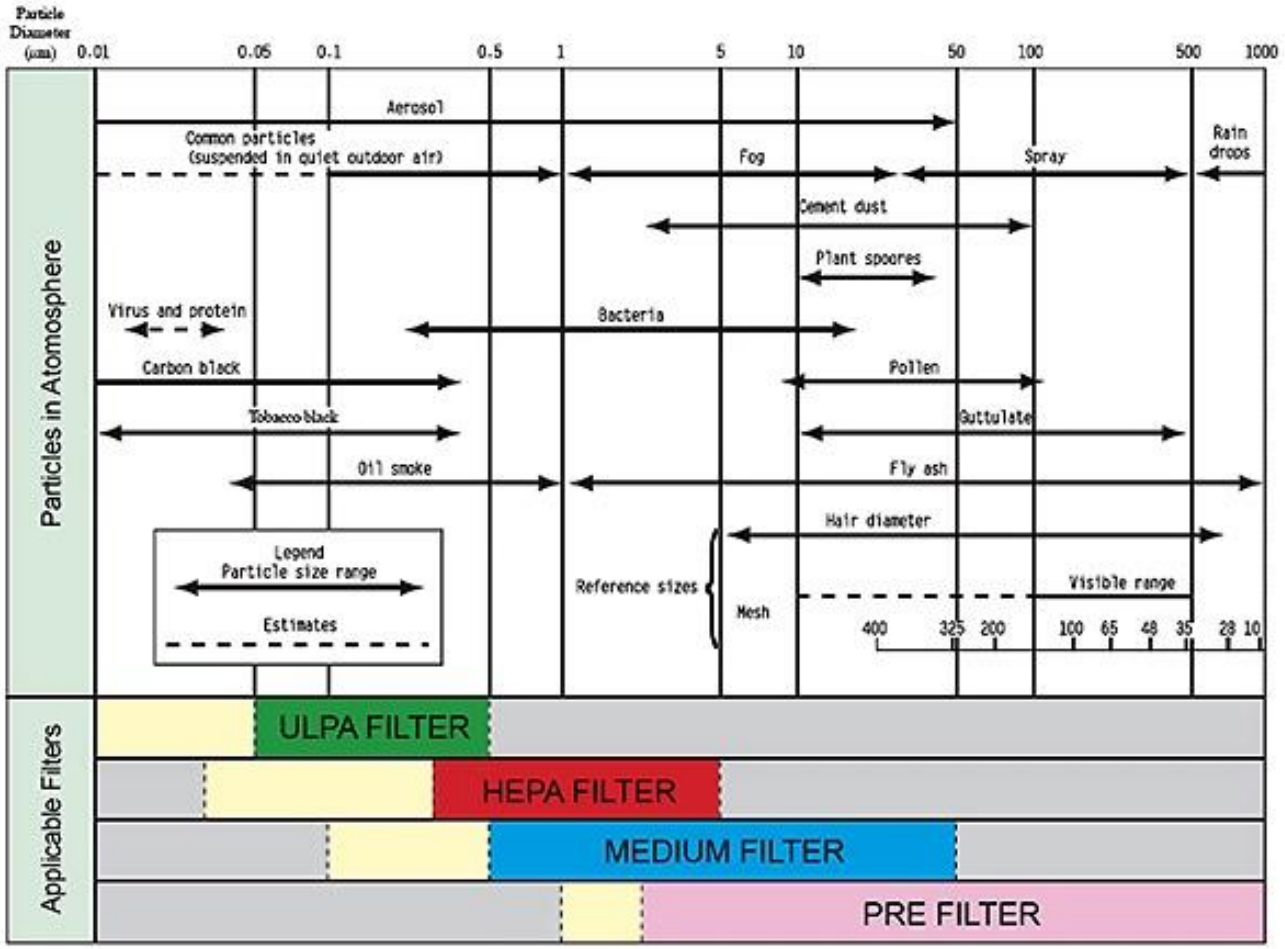




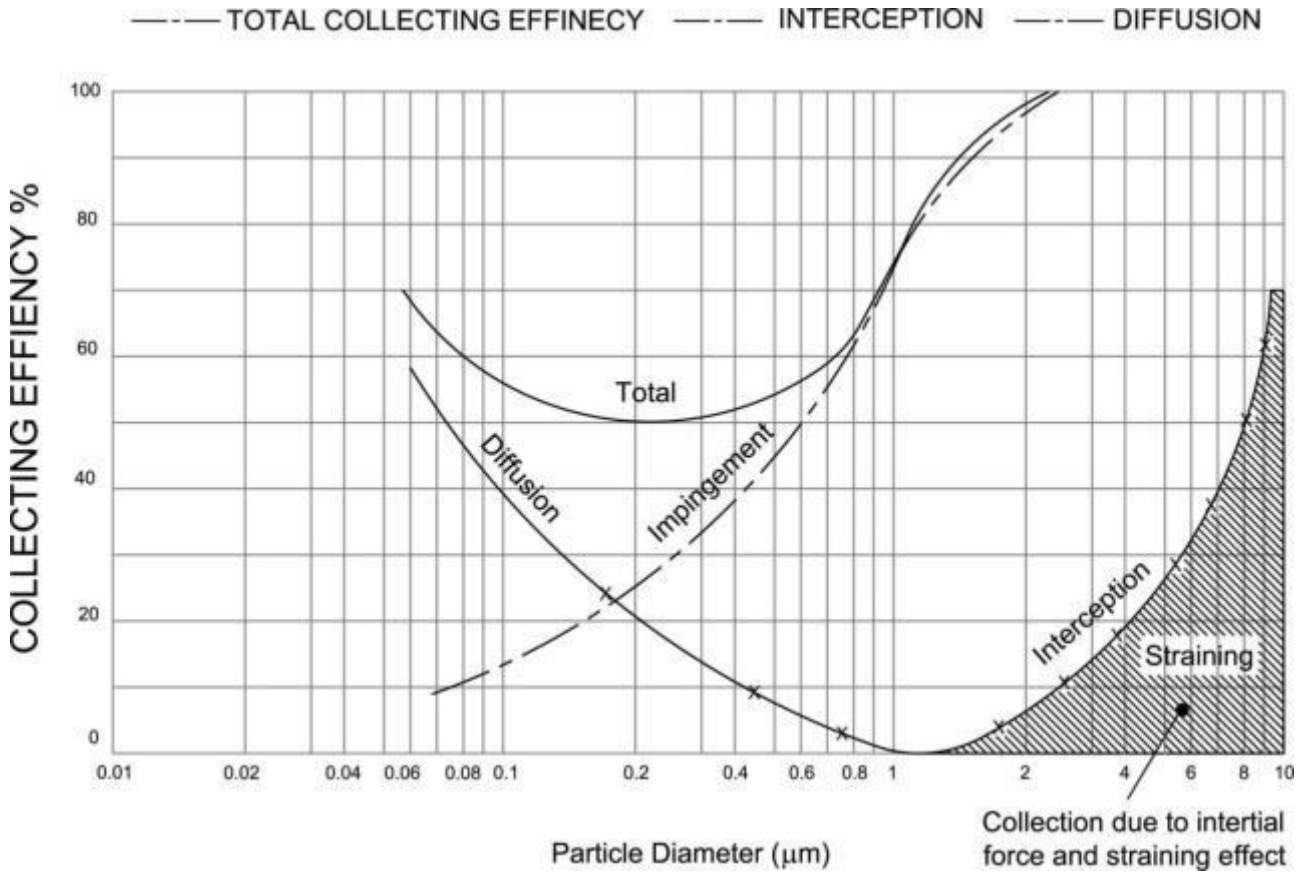




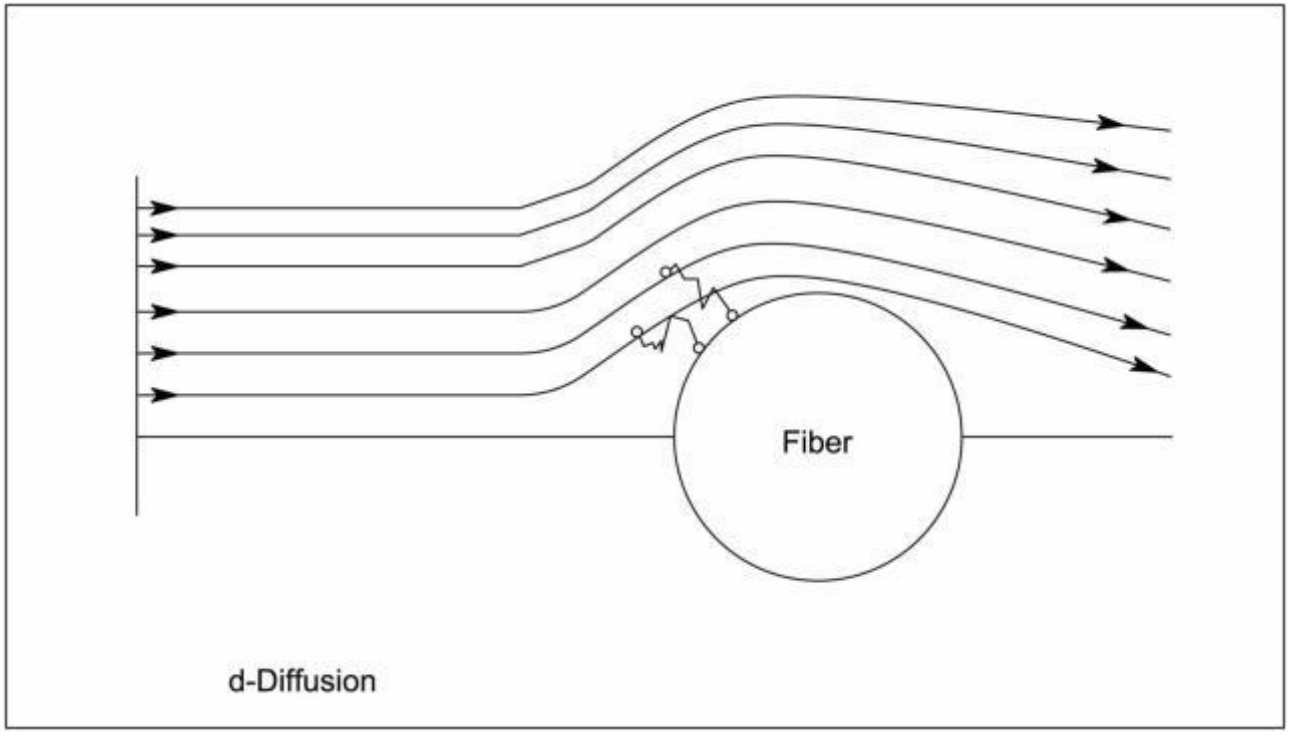
Filtration Size and Type



Filtration Effects and Principles



Diffusion



Testing standards and methods

MERV Filter Efficiency Guide

MERV Rating	Efficiency	Arrestance	Filter Types	Tested Contaminants
1-4	>20%	60-80%	Disposable Paper, Permanent Metal, Fiberglass & Foam Media, Animal Hair	Pollen, Spanish Moss, Dust Mites, Sanding & Spray Paint Dust, Textile & Carpet Fibers
5	>20%	80-90%	Pleated Panel Filters, Ring Panel Filters, Synthetic Media	Pudding Mix, Snuff, Powdered Milk
6	20-30%	90-95%	Cube Filters, Self-Supported Filters	Dusting Aids, Cement Dust
6-7	25-30%	90-95%	Pleated Panel Filters	Hair Spray, Fabric Protector
8	40-50%	95-98%	Pleated Panel Filters, Ring Panel Filters, Extended Surface Pocket Filters	Mold Spores
9-10	50-60%	98%	Extended Surface Pocket Filters	Welding Fumes, Nebulizer Drops, Coal Dust, Auto Emissions
10-11	60-70%	99%	Pleated Panel Filters, Extended Surface Pocket Filters, Rigid Cell Filters	Lead Dust, Milled Flour
12-14	80-90%	99%	Extended Surface Pocket Filters	Humidifier Dust, Smoke, Copier Toner, Face Powder, Paint Pigments, Insecticide Dust, Legionella
14-15	90-95%	99%	Extended Surface Pocket Filters, Rigid Cell Filters	Sneeze, Cooking Oil
16	95%	N/A	Rigid Cell Filters	Bacteria, Tobacco Smoke

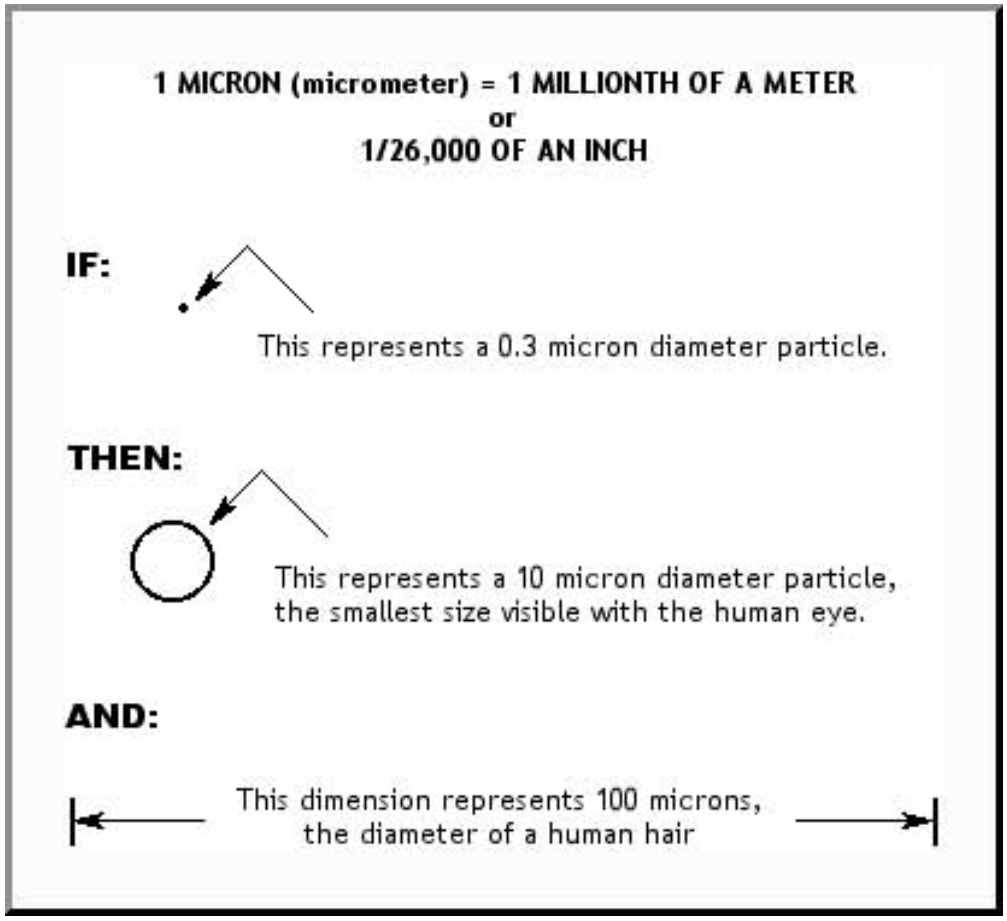
Comparison

Filter group	Filter class	Filter separation efficiency (%)				Measuring method (test aerosol, standard)
		Average separation efficiency A_m	Average separation efficiency E_m	Total	Local [1]	
Coarse (G)[4]	G1	$50 \le A_m < 65$				Synthetic dust test PN-EN 779:2005
	G2	$65 \le A_m < 80$				
	G3	$80 \le A_m < 90$				
	G4	$90 \le A_m$				
Fine (F) [5]	F5		$40 \le E_m < 60$			Aerosol test DEHS Separation efficiency measured for particles of 0,4 µm size PN-EN 779:2005
	F6		$60 \le E_m < 80$			
	F7		$80 \le E_m < 90$			
	F8		$90 \le E_m < 95$			
	F9		$95 \le E_m$			
HEPA (H) [6]	H10			85	-	Numerical efficiency defined for the size of the most penetrating particles (MPPS) by means of the aerosol test DEHS[2], DOP [3] or paraffin oil mist PN-EN 1822-5:2002
	H11			95	-	
	H12			99,5	97,5	
	H13			99,95	99,75	
	H14			99,995	99,975	
ULPA (U) [5]	U15			99,9995	99,9975	
	U16			99,99995	99,99975	
	U17			99,999995	99,9999	

Efficiency

Number of Organisms Challenging the Filter	Number of Organisms Passing Through the Filter	% Efficiency
1,000,000	100,000	90
	10,000	99
	1,000	99.9
	100	99.99
	30	99.997
	10	99.999
	1	99.9999

Visualization of a MICRON



Qualification Testing to EN 779



Safe Change Housing BiBo

Test procedure – ASME N 510:

Test Method Statement

Leakage Test (according ASME 510) on Safe Change Housing Type HO-Housing

Safe Change Housing No.: ..... **of Batch No.:** .....

Manufacturer:	Beth-El Zikhron Yaaqov Industries Ltd. 1 Avshalom Road Zikhron Yaaqov 30900 Israel
Date of Test:	.....
Time of Test:	.....

Safe Change Housing BiBo

Test procedure – EN 1822:

Test Method Statement

Efficiency Tests (according EN 1822) on HEPA filters

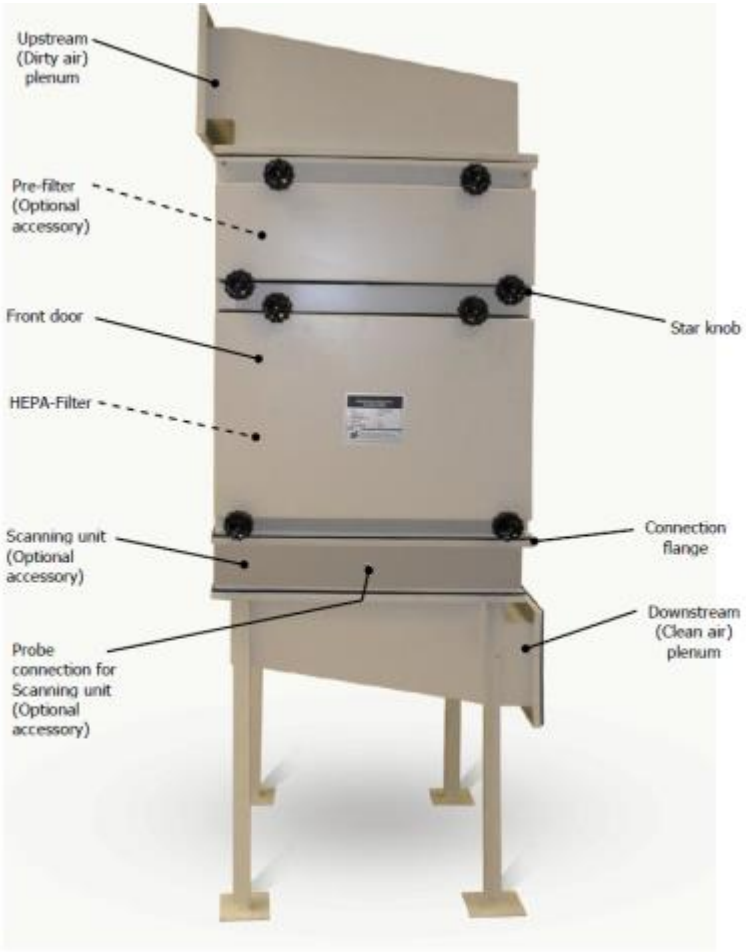
HEPA filter No.: …….. **Batch No.: ……**

Manufacturer:	Beth-El Zikhron Yaaqov Industries Ltd. 1 Avshalom Road Zikhron Yaaqov 30900 Israel
Date of Test:	……
Time of Test:	……

BiBo filtration systems

(Importance, components, procedures, decontamination)

Safe Change Housing BiBo



Safe Change Housing BiBo

Safe Change Units (up to BSL 4)

Available modules:

- Prefilter Unit
- HEPA Filter Unit (alternatively ULPA Filter)
- Second HEPA Filter Unit
- HEGA Unit (High Efficient Gas Absorber)
- Decontamination Ports
- Scan Units
- DOP / Freon Test ports
- Bubble tight dampers
- Pressure Gauge / Pressure transmitters

Customization is always welcome

Safe Change Housing BiBo

Safe Change Units (up to BSL 4)

Designed and tested to:

- EN 1822
- ANSI / ASME N 509
- ANSI / ASME N 510
- AISI 304 or AISI 316
- DIN 287
- AS 9100 / KTA 1401

Clean Air Supply Units



Safe Change Units



HO Housing – modular system



HO Housing – easy and safe operation due to patented technologies

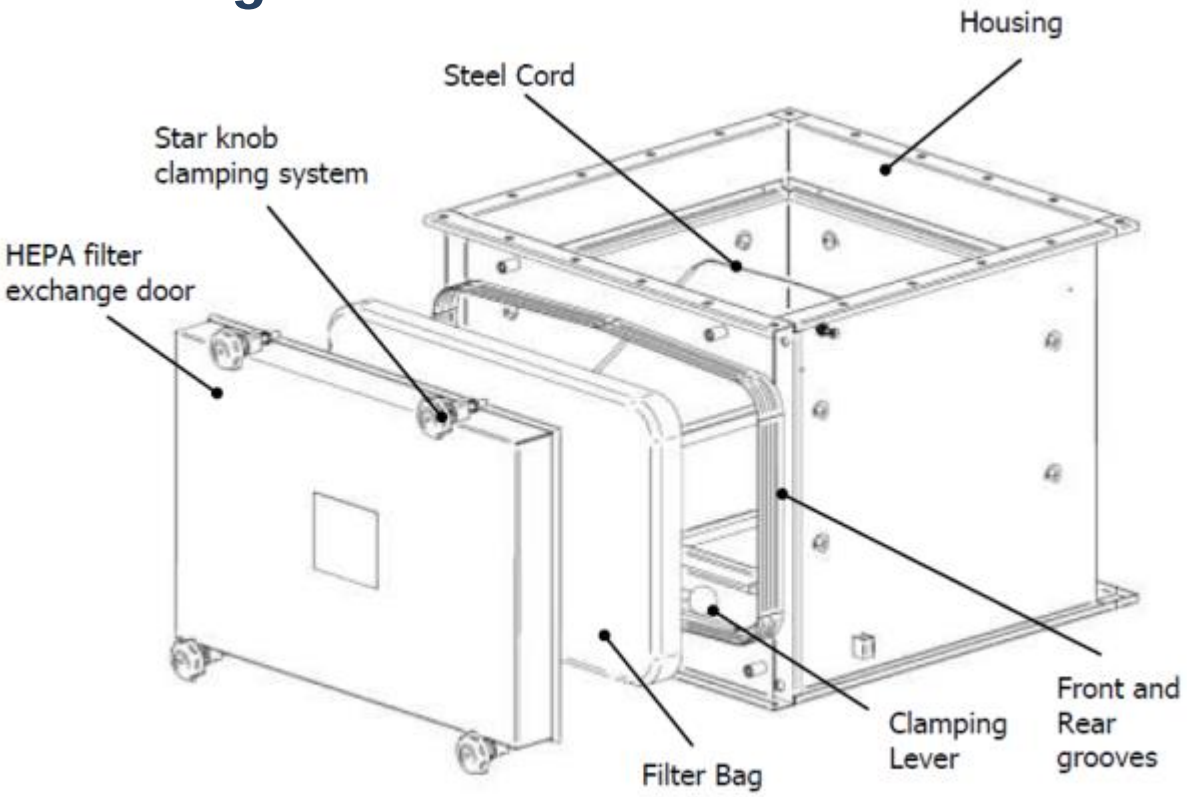


Fig. 2-1: Safe Change Housing

HO Housing – highest quality



HO Housing – safe and easy to change Filter and operate filter clamping mechanism









In-line BiBo System



Space friendly design

Internal Unit Structure



Multiple Units



Mobile Medical Solutions

Isolation Rooms
Clean Rooms
Isolation Stretchers
Filtration Systems

Mobile Medical Solutions



Mobile Isolation Rooms



Medical Filtration Systems



Isolation/Clean Stretchers



Mobile Clean Rooms

Why Mobile Medical Facilities ??

- the solution is brought to the problem



- Significant less investment

Average permanent Isolation Room = 

cost approx. 20% only compared to permanent room

- High flexibility in different scenarios



“IsoArk” –
the mobile negative pressure isolation chamber

For use in Hospitals and Field Laboratories

For Land & Air transport





Isolation/Sterile Stretcher

Isolated transport in ground and air borne missions!

- ✓ First Responder Units
- ✓ Fire Brigades
- ✓ Air Ambulance Services
- ✓ Disaster Organizations







Transport of Ebola Patient

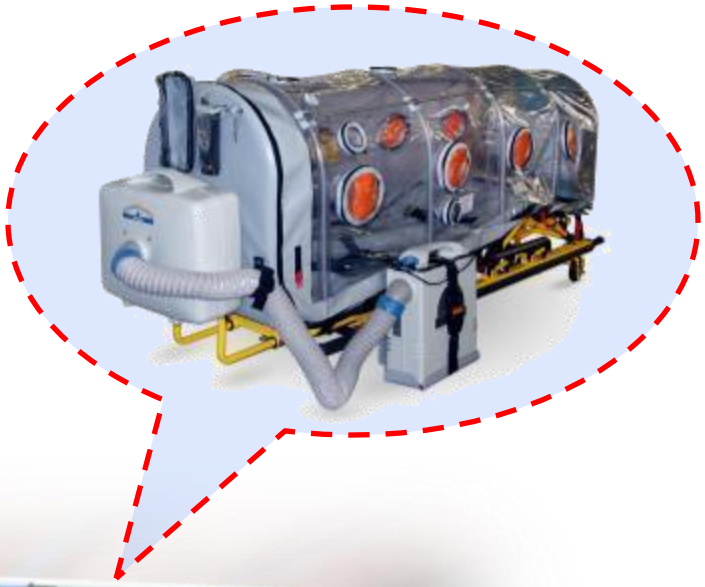








IsoArk N36 in Ambulance









Mobile Isolation-/Clean Rooms

- Intensive Care/
  Field Laboratory
- Compact package and
  storage
- Set-Up in less than 1 hour









Over-pressurized Mobile Surgery Rooms

- ✓ Disaster Organizations
- ✓ Aid- and Relief Groups
- ✓ Mobile laboratories/Clean rooms



Eye operation Maledives



Beth-El Industries in conclusion

- ✓ Experience of more than 40 years
- ✓ Partner of choice for more than 70 armies
- ✓ Solutions customized to every individual customer
- ✓ Design/Production/Integration/Training/After-Sales-Service from one source
- ✓ Products worldwide recognized as “top value for money”
- ✓ Global reputation for very low system Life-Cycle-Cost

Beth-El Industries in conclusion

- ✓ Beth-El is a leading supplier of air filters and air filtration system
- ✓ The HO-housing BiBo system is a high quality, high performance safe change system
- ✓ Pre-filters, HEPA-filters and carbon filters are manufactured in-house in order to ensure perfect compatibility
- ✓ All systems are 100% tested in the facture
- ✓ We have supplied thousands of filtration systems worldwide.
- ✓ Global reputation for very low system Life-Cycle-Cost

Thank you for your attention!

Any questions?

Contact Local Representative



BIO-POINTE PTE LTD

3015A Ubi Road 1 #04-01
Singapore 408705
Tel : 6748 8911 Fax : 6749 1701
www.biopointe.com.sg

Desmond Tan desmondtan@biopointe.com.sg
Foong Yuen fyuen@biopointe.com.sg
Kwok Yuen Jinn jinn@biopointe.com.sg