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High Purity Filtration Solutions

Airtight Duct Housings for HEPA Filters

AstroSafe KSS
Housing for HEPA Filters

AstroSafe KSS

HOUSING FOR HEPA FILTERS

Product description

The AAF AstroSafe-KSS in-line HEPA filter housing is an airtight duct housing, designed for in-line installation in air supply, re-circulation or exhaust ducting. Typical applications include for supply and extraction systems in:

- Pharmaceutical production suites
- Pharmaceutical and Biotechnology laboratories
- Animal laboratories
- Hospital and other healthcare facilities
- Optical industries

The AstroSafe-KSS in-line HEPA filter housing is made from mild steel, which is suitably reinforced and comes with drilled flanges on both sides. Airtight side-access maintenance doors with star-wheel turn-locks enable replacement of the filter elements. The entire housing comes with an epoxy powder coated finish, which is easy to decontaminate and resistant to disinfectants.
The HEPA filter is placed into a frame and sealed in the housing by a stainless steel mechanism. This mechanism is operated with a single lever and is maintenance-free. Options include an integrated prefilter section, duct transition pieces and a support structure.

Features and Benefits

- Maintenance-free
- Epoxy-coated steel construction
- Side access for easy filter replacement

Optionally available Features

- Optional integrated prefilter section
- Optional DIN test groove
- Transition pieces
- Low leaking or air tight valves
- Manual scan system to test the filter in situ
- Magnehelic pressure gauges
- Stainless steel, 304 as well as 316
- Support legs for installation on the floor

Applications

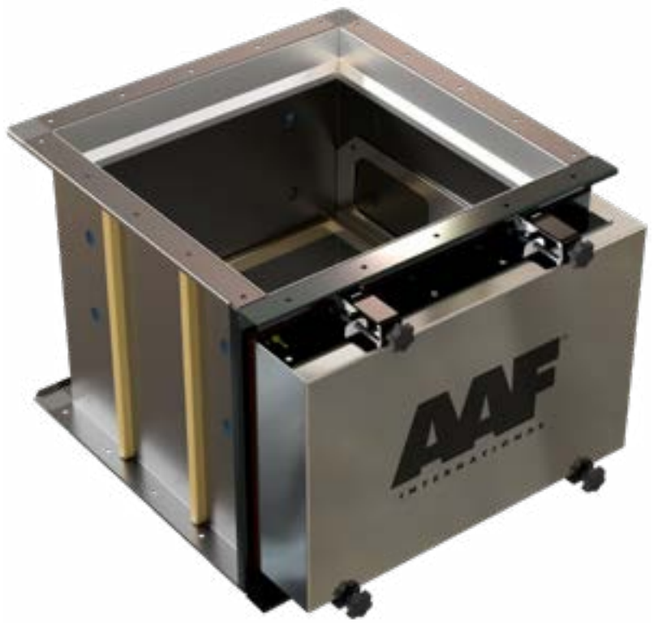
The KSS in-line housing has been designed for applications in which HEPA filters are required in the supply and recirculation air ducts. Such housings are used in:

Pharmaceuticals

Biotechnology

Optics

Healthcare



Housing configuration

Construction	Main housing manufactured from 2 mm mild steel
Finish	Powder coated, color white, RAL 9010
Construction	Welded air tight construction
Flanges	57 mm wide flange, pre-drilled for easy installation on site
Pressure drop fittings	Includes for 2 pressure tapping points to monitor the pressure drop over the filter or to be used to measure the aerosol concentration in the housing during HEPA filter testing according ISO 14644-3
Filter clamping arrangement	Filter clamping arranged with single bar, pre–adjusted in our factory to ensure gasket compression and air tight seal of the filter when clamped. Stainless steel clamping arrangement. A provision in the door has been included which prevents door placement when the filter clamping arrangement is not in the clamped position.
Door	Door is secured to the housing by means of 4 star knobs that compress a continuous rubber band that is installed on the edge of the door.
Filters	Housing designed to fit a H13 or H14 filter in the size 610 x 610 x 292 such as the AstroCel I, AstroCel III, MEGAcel I, MEGAcel III
Filter seal	Gasket, closed cell, (applied to the filter)

Housing Dimensions

Housing style code	Housing dimensions (mm)			Filter dimensions (mm)
	W	H	D	
1W1H	736	736	580	610 x 610 x 292 mm
1W2H	736	1473	580	610 x 610 x 292 mm
1W3H	736	2206	580	610 x 610 x 292 mm
2W1H	1363	736	580	610 x 610 x 292 mm
2W2H	1363	1473	580	610 x 610 x 292 mm
2W3H	1363	2206	580	610 x 610 x 292 mm

Notes
1) First digit indicates number of filters in width, second digit indicates number of filters in height.
2) Add 270 mm to depth for 50 mm pre-filters and 320 mm for 100 mm pre-filters.
3) Other materials (aluminium or stainless steel) are available on request.

Example construction of an AS KSS with 2 adjacent filter housings arranged in a double row without prefilter

AstroSafe KSS

HOUSING AND FILTER SELECTION

Selection Table

Style code AS-KSS-XX-X		Example: AS-KSS 32-N-4	
	Size (See Table)	Dry Gasket	
XX	First digit: number adjacent filter housings Second digit: single (1) or double (2) row	32	Three adjacent filter housings Double row
X	Prefilter / No prefiter (P or N)	N	No prefilter
X	Number of main filters in air flow direction	6	Six main filters in air flow direction

How to Order

Below is a typical example of how to order a standard AstroSafe KSS Housing using the Component Code Definition System.

Component Definition	AS	KSS	32	N	6

Filter Selection Guide

Filter	AstroCel I	AstroCel IIII	MEGAcel I eFRM	MEGAcel III eFRM
Nominal Airflow	3000 m^3/h	4000 m^3/h	3000 m^3/h	4000 m^3/h
Filter class	H13 99,95% @ MPPS		H14 99,995% @ MPPS	
Initial resistance @ Nominal air flow H13	300 Pa	285 Pa	175 Pa	220 Pa
H14	350 Pa	400 Pa	220 Pa	250 Pa
Media	Glass media		eFRM media	
Filter cell side material	Galvanized Steel		Optional: Stainless steel	
Gasket Type	Flat Gasket		Optional: Foamed gasket	
Media Pack	Deep pleat, 260 mm	Mini pleat, 25 mm (10 packs)	Deep pleat, 260 mm	Mini pleat 25 mm (10 packs)
Sealant	The media pack is bonded to the cell sides using polyurethane (PU)			
Testing	Filters are individual factory tested and certified in accordance with the European Standard EN 1822			
Outside filter dimensions (mm):	610 x 610 x 292			
Tolerance outside filter dimensions (mm)	+ 1.5			
Tolerance pressure drop (%):	± 15%			

Filter Recommendations

PROVIDING HIGH-EFFICIENCY

AstroCel® I HC

- EN1822: E12, H13 and H14
- Utilizes high performance microglass media to provide high efficiency particulate removal
- Available as standard or high capacity (HC) with a variety of construction materials and cellside configurations
- HC configuration offers twice the airflow with a limited increase in initial resistance
- Compatible with Discrete Particle Counter (DPC) and photometric test methods
- Laminar airflow allows filter scanning acc: ISO 14644

AstroCel® III

- Available in efficiency classes E12 - H14
- V-shaped filter configuration, combined with high performance microglass media, delivers higher flow and a lower pressure drop vs traditional box style microglass HEPA filters
- Utilizes high performance microglass media to provide high efficiency particulate removal
- Compatible with Discrete Particle Counter (DPC) and photometric test methods as access and instrumentation allow

MEGAcel® I

- Available efficiencies: H13 and H14 (EN1822:2009)
- Dual-layer eFRM media combines ultra-high efficiency and particulate loading with low pressure drop
- High tensile strength and chemically inert eFRM reduces risk of media damage and degradation
- No boron outgassing
- Compatible with Discrete Particle counter (DPC) and photometric test methods, including high concentration oil-based aerosol testing
- Laminar airflow allows filter scanning acc: ISO 14644

MEGAcel® III

- Available in efficiency classes H13 and H14 (EN1822:2009)
- V-shaped filter configuration, combined with dual-layer eFRM media, delivers higher flow and high capacity particulate loading with low pressure drop
- High tensile strength and chemically inert eFRM reduces risk of media damage and degradation
- No boron outgassing
- Compatible with Discrete Particle Counter (DPC) and photometric test methods, including high concentration oil-based aerosol testing as access and instrumentation allow

Biological Safety Levels (BSL)

BIOSAFETY APPLICATIONS OF ASTROSAFE HOUSINGS

Biological Safety Levels (BSL) are a series of protections rmeasures designed for biological labs. They are individual safeguards to protect laboratory personnel, as well as the surrounding environment and community.

These levels, which are ranked from one to four, are selected based on the agents or organisms that are being researched or worked on in any given laboratory setting. For example, a basic lab setting specializing in the research of nonlethal agents that pose a minimal potential threat to lab workers and the environment are generally considered **BSL-1**—the lowest biosafety level. A specialized research laboratory that deals with potentially deadly or incurable infectious agents like Ebola would be designated as **BSL-4**—the highest and most stringent level.

The Centers for Disease Control and Prevention (CDC) sets BSL as a way of exhibiting specific controls for the containment of microbes and biological agents. Each BSL builds on the previous level—thereby creating layer upon layer of constraints and barriers. These lab levels are determined by the following:

- Risks related to containment
- Severity of infection
- Transmissibility
- Nature of the work conducted
- Origin of the microbe
- Agent in question
- Route of exposure

BSL-1

As the lowest of the four, biosafety level 1 applies to laboratory settings in which personnel work with low-risk microbes that pose little to no threat of infection in healthy adults. An example of a microbe that is typically worked with at a BSL-1 is a nonpathogenic strain of E. coli.

BSL-1 labs require immediate decontamination after spills. Infection materials are also decontaminated prior to disposal, generally through the use of an autoclave.

BSL-2

This biosafety level covers laboratories that work with agents associated with human diseases (i.e. pathogenic or infections organisms) that pose a moderate health hazard. Examples of agents typically worked with in a BSL-2 environment include equine encephalitis viruses and HIV, as well as Staphylococcus aureus (staph infections).

BSL-2 laboratories maintain the same standard microbial practices as BSL-1 labs, but also includes enhanced measures due to the potential risk of the aforementioned microbes. Personnel working in BSL-2 labs are expected to take even greater care to prevent injuries such as cuts and other breaches of the skin, as well as ingestion and mucous membrane exposures.

BSL-3

Again building upon the two prior biosafety levels, a BSL-3 laboratory typically includes work on microbes that are either indigenous or exotic, and can cause serious or potentially lethal disease through inhalation. Examples of microbes worked with in a BSL-3 includes; yellow fever, West Nile virus, and the bacteria that causes tuberculosis.

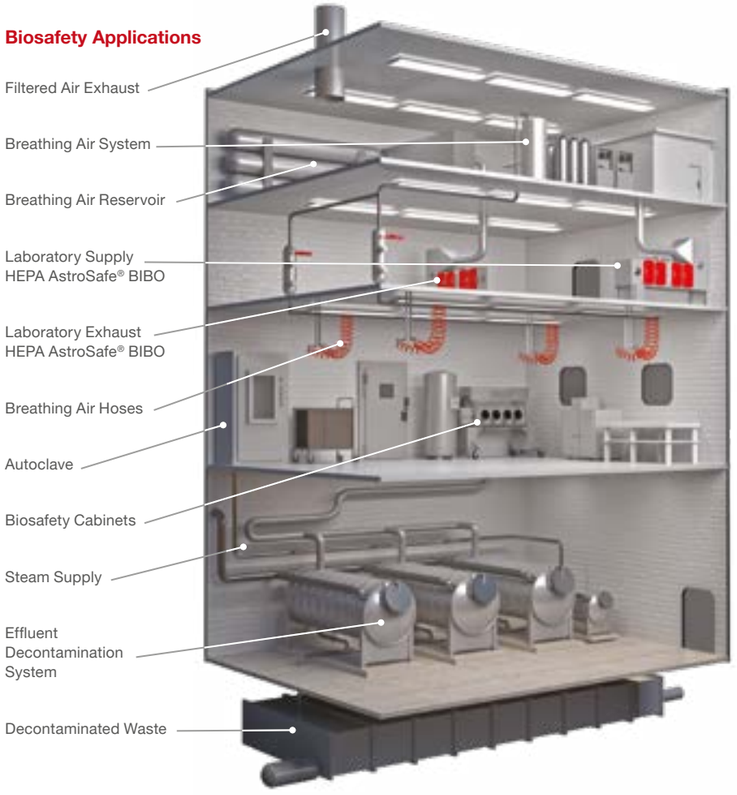
The risk is such that the work is often strictly controlled and registered with the appropriate government agencies. Laboratory personnel are also under medical surveillance and could receive immunizations for microbes they work with. Access to a BSL-3 laboratory is restricted and controlled at all times.

BSL-4

BSL-4 labs are rare. However some do exist in a small number of places in the U.S. and around the world. As the highest level of biological safety, a BSL-4 lab consists of work with highly dangerous and exotic microbes. Infections caused by these types of microbes are frequently fatal, and come without treatment or vaccines. Two examples of such microbes include Ebola and Marburg viruses.

A BSL-4 laboratory is extremely isolated—often located in a separate building or in an isolated and restricted zone of the building. The laboratory also features a dedicated supply and exhaust air, as well as vacuum lines and decontamination systems.

Biosafety Applications



Summary of Recommended Biosafety Levels for Infectious Agents

Biological Safety Levels (BSL)

	Agents	Practices	Primary Barriers and Safety Equipment	Facilities (Secondary Barriers)	Recommended AstroSafe Housings
1	Not known to consistently cause diseases in healthy adults	Standard microbiological practices	• No primary barriers required • PPE: laboratory coats and gloves; eye, face protection, as needed	Laboratory bench and sink required	AstroSafe KSS
2	• Agents associated with human disease • Routes of transmission include percutaneous injury, ingestion, mucous membrane exposure	• Limited access • Biohazard warning signs • "Sharps" precautions • Biosafely manual defining any needed waste decontamination or medical surveillance policies	• BSCs or other physical containment devices used for all manipulations of agents that cause splashes or aerosols of infectious materials • PPE: laboratory coats, gloves, face and eye protection, as needed	Autoclave available	AstroSafe KSS, AstroSafe RPT
3	Indigenous or exotic agents that may cause serious or potentially lethal disease through the inhalation route of exposure	• Controlled access • Decontamination of all waste • Decontamination of laboratory clothing before laundering	• BSCs or other physical containment devices used for all open manipulations of agents • PPE: Protective laboratory clothing, gloves, face, eye and respiratory protection, as needed	• Physical separation from access corridors • Self-closing, double-door access • Exhausted air not recirculated • Negative pressure airflow into laboratory • Entry through airlock or anteroom • Hand washing sink near laboratory exit	AstroSafe RPT
4	• Dangerous/exotic agents which post high individual risk of aerosol-transmitted laboratory infections that are frequently fatal, for which there are no vaccines or treatments • Agents with a close or identical antigenic relationship to an agent requiring BSL-4 until data are available to redesignate the level • Related agents with unknown risk of transmission	• Clothing change before entering • Shower on exit • All material decontaminated on exit from facility	All procedures conducted in Class III BSCs or Class I or II BSCs in combination with full-body, air-supplied, positive pressure suit	• Separate building or isolated zone • Dedicated supply and exhaust, vacuum, and decontamination systems	AstroSafe B-Series

AAF International Plant Locations

AAF, the world's largest manufacturer of air filtration solutions, operates production, warehousing and distribution facilities in 22 countries across four continents. With its global headquarters in Louisville, Kentucky, AAF is committed to protecting people, processes and systems through the development and manufacturing of the highest quality air filters, filtration equipment, and associated housings and hardware available today.

Contact your local AAF representative for a complete list of AAF Air Filtration Product Solutions.

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