ISOLATION SYSTEMS INC.

GENERAL SPECIFICATIONS - STEEL EQUIPMENT

CONSTRUCTION

- ***HOUSINGS*** All equipment housings are constructed of cold rolled steel or stainless steel. Material gauge thickness will vary with use based upon structural requirement. For detailed material call-outs consult specific product data sheets and construction approval drawings. All panel fastening is by way of both mechanical type attachment and welded assembly method. All CRS and HRS assemblies are bonderized and coated with white polyurethane finish. All stainless steel assemblies are of type 304 material with a #4 finish, unless otherwise specified. Galvanized steel may be used for non-exposed plenum dividers and duct work. Trim packages are fabricated of anodized aluminum or, if specified, stainless steel with #4 finish. All pressurized areas of housings are fully sealed against bypass at factory. All housings are constructed of 100% non-shedding materials.

- ***MOTORS/BLOWERS*** Our units utilize direct-drive external rotor motors with backward-curved impellers or squirrel cage type forward curved assemblies. These blower assemblies are arrayed so as to provide even and constant air flow over the entire filter face. Our standard systems are designed to perform at or below OSHA recommended db levels, providing for quiet, efficient operation. Power requirements are 115v-60hz-1ph. Alternative voltages are available. Blower impellers are of molded fiber impregnated polycarbonate resin, galvanized steel or aluminum. All assemblies are dynamically balanced at factory to ensure vibration-free operation. All blower motor assemblies are mounted in place upon vibration isolators to further enhance smooth, quiet function. All bearings are permanently sealed and lubricated. All motors are furnished with internal thermal overload protection. These motors have a broad operating temperature range from -22^{0}F to +170^{0}F. All backward-curved blowers are capacitor-run type. Motor HP, blower size and air requirements are predetermined by our engineering staff to assure adequate air flow volume for your specific applications.

- ***FILTRATION*** All **Isolation Systems, Inc.** Glove Boxes and Laminar Flow work stations are equipped with standard sized prefilters and final filtration modules. Prefilters are of the disposable fiberglass type or poly fiber. Final filters are high efficiency particulate air (HEPA) 99.99% efficient @ .3 microns based upon manufacturer's certified testing. ULPA filtration rated at 99.9995% efficient @ .12 microns (bio sterile) is available for applications where ultra-clean atmospheres are required. All filters are potted into heavy wall anodized aluminum frames - the potting material is polyurethane polymer. Filter medial is of string separater type and non-shedding glass media. For uses where filter media is exposed, an expanded metal screen is provided for protection. Stainless steel perforated grilles are also available upon request.

GENERAL SPECIFICATIONS - STEEL EQUIPMENT

CONSTRUCTION…..cont'd

- ***LIGHTING*** All **Isolation Systems, Inc.** Glove Box Isolators , Laminar Flow stations and Entry Systems utilize 115v-60hz fluorescent luminaires. All light sources provided are clean room certified. Standard lighting levels at work surface are in excess of 80 F.C. Higher levels for special applications are optional. Custom spectrum lighting is optional.

PERFORMANCE

- ***PARTICLE COUNT*** All laminar flow work stations and assemblies are manufactured to meet or exceed standards as specified in Fed. Std. 209E, IES-RP-CC-002, Air Force Tech. Order T.O.00-25-203 and NASA Std. NHB-5440.2. Particle counts within enclosures will not exceed 100 particles per cubic foot larger than .5 microns.
- ***AIR FLOW*** Laminar air flow generation is designed for 90 FPM +/- 20% measured across filter face. During initial operation velocities will be measured at 90 - 110 FPM on average. After extended use, our system will maintain performance at or above double starting static pressure within laminar flow range.

FEATURES & OPTIONS

1. Knife edge to gel filter seal
2. Compression gasket seal
3. SS filter screens
4. Optional colors (CRS units)
5. Optional work surfaces
6. ULPA filtration 99.9995% eff. @ .12 microns
7. Blower speed control
8. Magnehelic gauges
9. Duplex outlets
10. Service fixtures
11. Sinks
12. Custom spectrum lighting
13. Visual air velocity monitor & alarm
14. Polypropylene lined
15. Polypropylene constructed
16. Exhausting benches
17. Recirculating benches
18. Explosion proof Class-1 Div-1

Full custom design & engineering services are offered by
Isolation Systems, Inc.
for your special needs and requirements.

ISI Isolation Systems Inc.

ISOLATION SYSTEMS INC.

GENERAL SPECIFICATIONS - POLYPROPYLENE ASSEMBLIES

CONSTRUCTION

- ***HOUSINGS*** All equipment housings are constructed of either white or natural stress relieved or fire retardant polypropylene. Material gauge/thickness will vary with use based upon structural requirements. General material thicknesses used are 1/8" ,1/4", 3/8", 1/2" & 3/4". For detailed material call-outs consult specific construction approval drawings or shop construction drawings. Work surfaces and structural panels are reinforced to conform to specific loading requirements. All panel fastening is both non-metallic mechanical type attachment and heat welded assembly method. All assembly edges are finished smooth to remove all sharp or frayed edges. All exposed welds are ground smooth. All standard assemblies are of stress relieved natural/white polypropylene unless otherwise specified. All operational hardware (hinges, latches, handles, etc.) is non metallic. Specific material types to be called out on final approval drawings. Trim packages & fascia close off panels are fabricated of polypropylene unless otherwise specified. All pressurized areas of Hood housings are secondarily sealed utilizing FDA approve silicone sealant unless otherwise specified to prevent air bypass. All housings are constructed of 100% non-shedding materials.

- ***LIFTING SASHES & SHIELDS*** All lifting sashes and face shields are fabricated of either 1/4" or 3/8" thick clear Acrylic or Polycarbonate. All edges are flame polished. All hardware is non-metallic.

- ***MOTORS/BLOWERS*** Our units utilize direct-drive external rotor motors with backward-curved impellers or squirrel cage type forward curved assemblies. These blower assemblies are arrayed so as to provide even and constant air flow over the entire filter face. Our standard systems are designed to perform at or below OSHA recommended Db levels, providing quiet, efficient operation. Power requirements are 115v-60hz-1ph. Alternative voltages are available. Blower impellers are of molded fiber impregnated polycarbonate resin, coated aluminum or 100% plastic squirrel cage and shroud for forward curved impeller systems. Note all drive/motor units are metallic and always located above HEPA filters. All assemblies are dynamically balanced at factory to ensure vibration-free operation. All blower motor assemblies are mounted in place upon vibration isolators to further enhance smooth, quiet function. All bearings are permanently sealed and lubricated. All motors are furnished with internal thermal overload protection. These motors have a broad operating temperature range from -22°F to +170°F. All backward-curved blowers are capacitor-run type. Motor HP, blower size and air requirements are predetermined by our engineering staff to assure adequate air flow volume for your specific applications.

ISI Isolation Systems Inc.

GENERAL SPECIFICATIONS - POLYPROPYLENE ASSEMBLIES

CONSTRUCTION…..cont'd

- ***FILTRATION*** All **Isolation Systems, Inc.** Laminar Flow work stations are equipped with standard sized prefilters and final filtration modules. Prefilters are disposable fiberglass or poly-fiber. Final filters are high efficiency (HEPA) 99.99% efficient @ .3 microns based upon manufacturers' certified testing. ULPA filtration rated at 99.9995% efficient @ .12 microns (bio sterile) is available for applications where ultra-clean atmospheres are required. All filters are potted into heavy wall anodized aluminum frames (Non-metallic coatings for final filter frames is available when required) media potting material is polyurethane polymer. Filter medial is of string separater or dimple pleat type, non-shedding glass media. Filter seal to system is via FDA approved silicone compression gasket. Filter clamping system is non-metallic. For uses where filter media is exposed, an expanded plastic screen is provided for protection.

- ***LIGHTING*** All **Isolation Systems, Inc.** Glove Box Isolators , Laminar Flow Stations and Entry Systems utilize 115v-60hz fluorescent luminaires. All light sources provided are cleanroom certified. Standard lighting levels at work surface are in excess of 80 F.C. Higher levels and spectrum lighting are optional.

PERFORMANCE

- ***PARTICLE COUNT*** All laminar flow work stations and assemblies are manufactured to meet or exceed standards as specified in Fed. Std. 209E, IES-RP-CC-002, Air Force Tech. Order T.O.00-25-203 and NASA Std. NHB-5440.2. Particle counts within enclosures will not exceed 100 particles per cubic foot larger than .5 microns.

- ***AIR FLOW*** Laminar air flow generation is designed for 90 FPM +/- 20% measured across filter face. During initial operation velocities will be measured at 90 - 110 FPM on average. After extended use, our system will maintain performance at or above double starting static pressure within laminar flow range.

FEATURES & OPTIONS

1. Knife edge to gel filter seal
2. Compression gasket seal
3. Plastic filter screens
4. Optional work surfaces
5. ULPA filtration 99.9995% eff. @ .12 microns
6. Blower speed control
7. Magnehelic gauges
8. Duplex outlets
9. Service fixtures
10. Sinks
11. Custom spectrum lighting
12. Visual air velocity monitor & alarm
13. 100% Exhausting Hoods
14. Recirculating Hoods
15. Base Cabinets
16. Explosion proof Cl-1 Div-1

ISI Isolation Systems Inc.

BASIC DISCUSSION OF TERMS AND CONCEPTS

CLEANING AIR

Federal standards have been established for room air cleanliness which describe how clean the air is in a given area. Per Federal Standard 209E, numeric classification means how many particles larger than .5 microns are acceptable within a classified clean environment. Hence, a *Class 100* environment would mean that no more than 100 particles larger than .5 microns would exist in any given cubic foot of air, *Class 1,000* would mean 1,000 particles and so on.

Isolation Systems, Inc. clean enclosures and laminar flow work stations will remove airborne particles through HEPA or ULPA filtration of air entering an environment. Our standard HEPA filter will intercept and trap 99.99% of all particles .3 microns or larger, to meet or exceed Class 100 standards for particulate control. The use of ULPA filtration will boost your environment classification to Class 10. The required level of cleanliness will vary from process to process.

LAMINAR FLOW

When the total air volume within a space moves in one direction at a uniform speed of between 70 - 110 FPM, its individual molecules assume parallel paths, or *streamlines.* The physics of this phenomenon allow for these streamlines of air to bend around objects and obstacles without losing laminarity or losing the particles which they carry.

Maintaining air flow laminarity within clean areas -and around and over your processes- will keep airborne contaminants (emanating from workers, nearby shedding processes and products) from fouling your critical process. The principle of laminar air flow is vital in contamination control. Air flow laminarity is a major component in the design and maintenance of clean environments.

Our engineers are experts in applying this technology to your specific process needs.

NOTE: All specifications and information provided in this catalog are subject to change without notice.

SYSTEM / AREA CLASSIFICATION CONFIGURATOR

CLEANROOM / AREA CLASSIFICATIONS

CLASS	AIR CHG / HR
10	300 + / ULPA
100	300
1000	150
10,000	75
100,000	20

OPERATOR EXPOSURE CONTAINMENT LEVEL CLASSIFICATIONS

CONTAINMENT LEVEL 1	**500-1000 ug / m3**
CONTAINMENT LEVEL 2	**100-500 ug / m3**
CONTAINMENT LEVEL 3	**25-100 ug / m3**
CONTAINMENT LEVEL 4	**< 25 ug / m3**
CONTAINMENT LEVEL 5	**< 5 ug / m3**

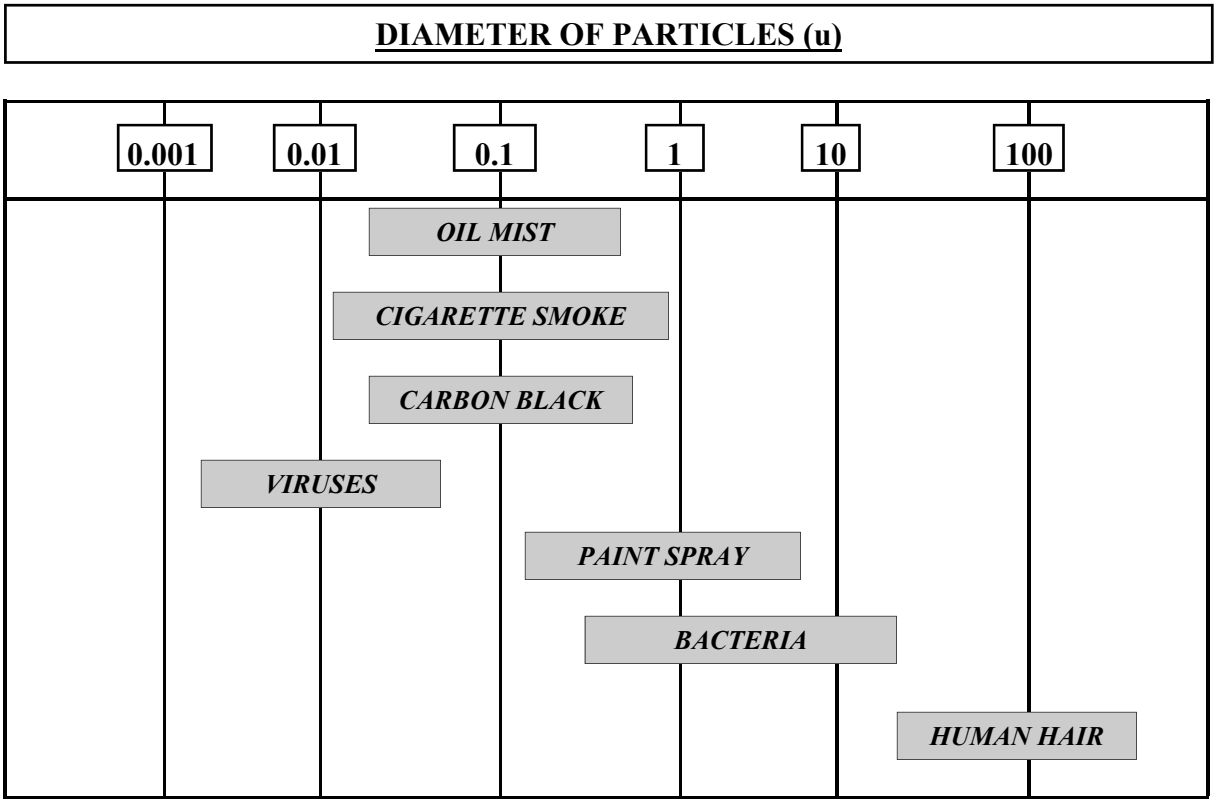
ISI Isolation Systems Inc.

ROOM CLASSIFICATION BASED ON AIR CHANGES PER HOUR PER FEDERAL STANDARD 209

R00M CLASSIFICATION	100,000	10,000	1,000	100
AIR CHANGES PER HOUR	20	75	150	300 / 350

NOTE : ***CLASS 10 LEVEL IS ACHIEVED BY USE OF ULPA FILTRATION AT LAMINAR FLOW CLASS 100 AIR CHANGES PER HOUR***

A Comparison of Particle Sizes



REQUIRED CLEANLINESS LEVELS FOR VARIOUS PROCESSES AND INDUSTRIES

PROCESS	CLASS 10	CLASS-100	CLASS-1000	CLASS-10,000	CLASS-100,000
ASEPTIC FILLING	■	■			
BACTERIA FREE		■			
TISSUE CULTURE		■	■		
PARENTERAL MFG		■			
GENERAL PHARMACEUTICAL		■	■	■	
INFUSION		■	■		
OPERATING ROOM		■	■		
SEMI CONDUCTOR	■	■	■		
IC VLSI MFG	■	■			
OPTICS	■	■	■		
FILMS		■	■	■	
ELECTRONICS			■	■	■
CHEMICALS		■	■	■	■
FOOD PROCESSING		■	■	■	■

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