



HALCO PRODUCTS COMPANY

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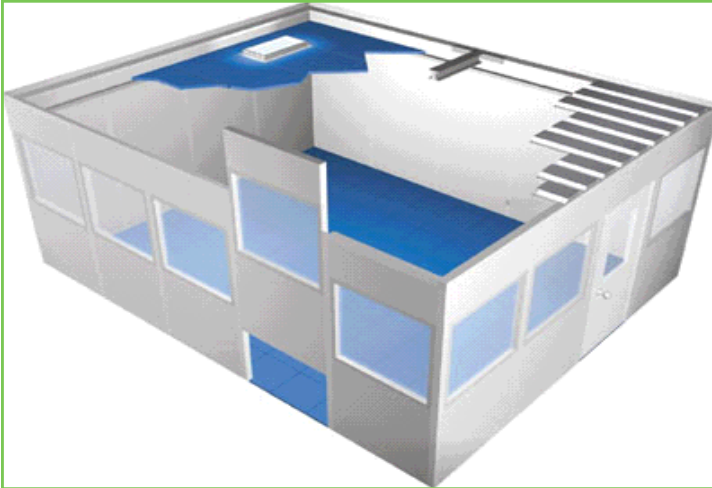
HALCO
PRODUCT
INFORMATION

100.1001

MODULAR CLEAN ROOM

Today's High Technologies Demand

- Hi-Tech Superclean Solutions
- Innovative Cleanroom Solutions for Every Need
- Modular & Engineered Systems to Meet Demanding Needs
- Turnkey Design Build Permitting One Responsible Source



Halco Products specializes in providing Clean or Sterile Modular Air Systems. The Module System has been designed to meet the cleanliness levels of ISO 5 (Class 100) through ISO 8 (Class 100,000). We design these systems to provide maximum prefabrication and performance while also providing features to enhance the clean room system. We

emphasize quality and pre-engineering to layout and design a functional and user friendly system to meet your specific needs.

TYPICAL APPLICATIONS

- BIOMEDICAL
- USP 797 / 800 PHARMACY
- CHEMICAL
- FOOD PROCESSING
- MICROELECTRONIC
- MANUFACTURING
- CLEAN PACKAGING

- PHARMACEUTICAL
- MILITARY
- HOSPITAL
- AEROSPACE
- COSMETICS
- COMPONENT ASSEMBLY

DESIGNED SPECIFICALLY FOR YOUR NEEDS

Halco's team of Design and Contamination Control Engineers will review your specific environmental problems. We will listen to how you plan to use the area, and review equipment loads, population characteristics; system requirements and evaluate all items so as to offer you; a clean enclosure that will perform well and fulfill your contamination control needs. From small workstations, mini-environment, and full size modular facilities, we will provide you with a clean manufacturing environment, specific to your needs.

Major Advantages

Walls:

Load bearing type walls all quick assembly and Easy modification and upgrades. Wall and deck panels are factory fabricated, allowing minimum on site construction time and plant disruption.

Roof Panels:

Allow sealed; leak free; ceiling cap to eliminate dust and dirt build up above actual clean room ceiling grid and framing. Roof is walkable and with structural can span hundreds of feet.

Doors:

Factory pre-hung standard man doors up through special Double, dutch type, double swing and fire rated. Roll up doors motorized and non-motorized, and simple Pass-Thru doors. Please feel free to let us know your specific door needs. Security hardware, card readers and several interlock systems are available to fulfill specific access/security needs.

Specialties

Clean Room Benches:

Halco manufactures hundreds of styles and designs of benches to allow a local workstation of high level of cleanliness where required. Units are various width's and have options such as, vacuum air, gas, sinks and chemical pipe connections. Contact our sales department with your needs for a complete comprehensive quote



Air Showers:

Dedicated, HEPA Filtered, high velocity dust and particle limiting enclosures of various sizes and configurations. Units can be fabricated of many types of materials. Microprocessor controlled, and interlocking doors provide a positive way to protect your valuable clean areas



Pass-Thru:

Pre-fabricated module either HEPA filtered or static in walls with two doors allowing passing of items from room to room without cross contamination problems. Units are available fire rated, special vent options, vent options, stainless or galvanized.



Cart Pass-Thru:

Pre-fabricated module, floor-mounted, either HEPA filtered or static with two doors allowing carts to pass from room to room without cross contamination problems. Units are available fire rated, special vent options, vent options, stainless, or galvanized.



CONSULTING AND REVIEW

Our professional staff of application engineers will meet with you; to create a detailed scope of work; defining all your facility integration needs such as; Mechanical, Electrical, Process Piping, Fire Suppression/Alarm Systems, and Flooring.

With this information we can put together the following:

- Project Budgets and Financial Impact Studies or Reports.
- Project Time Line and Schedule Analysis
- Taxable Impact and Calculations
- Vendor Analysis Reports to Compare “Applies to Apples”
- Risk Assessment of Exclusions; Leadtimes; Experience, and References

Design or Design/Build

Halco staff will offer design only or design/build project scope. Many customers prefer the design/build approach method of project delivery. This method allows facility planning/owners to work directly with our design team which limits your liability while expediting the process of project evaluation, overall goals, special requirements, and regulatory regulations and rules, to created a set of guidelines with which we can quickly respond with quotations, and get your project moving toward completion; built on time, and certified.



Certification Means Quality

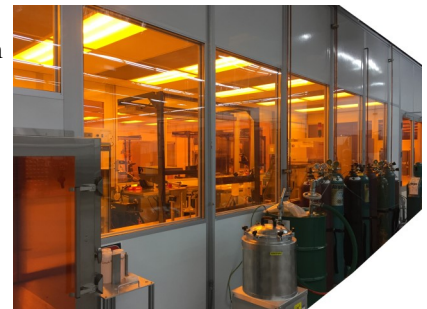
Halco design team's will review your project and evaluate the standards applicable, We support:

- ▲ IES-RP-CC006-2
- ▲ ISO-14644-1
- ▲ Federal Standard #209E

Testing and Certification

Halco provides analysis of your facility and benches as required to meet specified protocols. Regular testing must be established based on quarterly, semi-annual or annual review. Many super critical environments require 24-hour a day monitoring. We focus on monitoring your facility; or hoods; to monitor performance and identify significant changes inefficiency; signaling service or project contamination; prior to it effecting your cost of operation or product loss.

We will also review and assist with procedures and training techniques and develop enhanced protocols to meet your requirements.



Some Specific Area's We Review are:

- ▲ Temperature, Humidity Monitoring, For Stability and With-in Guidelines
- ▲ Airborne Particle Counting and Certification
- ▲ HEPA/ULPA Filter Scanning for Leaks
- ▲ Noise and Lighting Level Testing
- ▲ ESD (Static) Testing and Anti-Static Equipment
- ▲ Protocol Preparation and Evaluation
- ▲ Filter CFM/Velocity Testing
- ▲ Hood/Bench Certification and Review



SAMPLE SPECIFICATIONS

Part I: General

1.01 Description:

- A) Contractor to provide Pre-fabricated modular clean room system factory designed for easy on-site erection. System shall be in accord with ISO #14644 and all applicable codes and requirements.
- B) Modular system to include all doors, windows, supports, accessories as shown on drawings, and as specified.
- C) Manufacturer shall have at least 20 years experience in clean room design and shall submit a list of projects with contacts/names if requested.
- D) System shall be provided by **Halco Products Co. Elk Grove Village, IL 847-956-1600**.

1.02 Submittals:

- A) Submit shop drawings showing plan, elevation views with overall, and inter connection point dimensions.
- B) **Product Data:** Submit data sheets, component cuts, specific detail drawings for all components, and items pertaining to this project.
- C) **Installation Instructions:** Submit placement and configuration drawings; utility connection requirements; if any; job specific instructions and description.
- D) **Manufacturer's Certificate:** Certify that product will meet or exceed specified requirements. Provide standard testing protocol list; to insure requirements are met and that unit is factory tested and certified prior to shipment.

1.03 Close Out Submittals:

- A) Contractor to provide close out documentation of project. Documentation shall include but not be limited to the following documentation (or as required in writing from customer):
 - 1) Final "AS BUILT" drawings
 - 2) Installation maintenance and operation manuals for "ALL" equipment provided on project as well as room design criteria and servicing protocol.
 - 3) Start-up and validation documentation as specified for this project. Documentation shall include signed and dated Start up documents. Certified particle count forms and "Certificate" suitable for framing. Hepa CFM documentation and start up forms for EACH HEPA Module.
 - 4) Operation and Maintenance requirements and Dates.
 - 5) Start-up instructions, maintenance data, parts lists, controls and accessories.

1.04 Qualifications:

- A) **Manufacturer:** Company specializing in manufacturing products specified in this section with minimum of 20 years experience.
- B) **Installer:** Company specializing in performing work of this section with minimum ten (10) years documented experience installing Clean rooms and pre-approved by Owner or Architect prior to bid date.

1.05 Delivery, Storage, Handling:

- A) Product storage and handling requirements.
- B) Accept Modular Clean Room System and all required components on site in factory packaging and inspect for damage.
- C) Protect Modular Clean Room System and all components from contamination by storing in clean "Project Manager Approved" location.

1.06 Field Measurements:

- A) Verify field measurements prior to fabrication. Contractor to receive final approval from customer or Architect prior to releasing for final fabrication.

1.07 Warranty:

- A) Contractor to provide Product warranties and product "As-Built" drawings and manuals.
- B) Provide (1) one year warranty from date substantial completion or "of acceptance" or as provide in writing by client on unit and all subcomponents against defects in material and workmanship.

Part II: Products

2.01 Specialties:

- A) **Manufacturer:**
 - 1. **Halco Products Company**
 - 2. _____
 - 3. _____
 - 4. **Substitutions:** Materials and systems shall be as specified on drawings or as pre-approved by architect or owner prior to bidding.

2.02 Class of Room and Usage:

- A) Modular Clean Room shall be rated at _____ (insert rating) and shall be designed for such use. Room shall maintain _____ (degrees), _____ (RH), and _____ (static pressure) during normal operation as outlined on the drawings.
- B) Modular Clean Room shall have _____ (lumens) throughout all areas and as shown on drawings.

2.03 Doors:

- A) Manufacturer shall provide all doors as shown on drawings and outlined in specifications. All doors shall include all specialties including but not limited to, butts & hinges, thresholds, seals, astragals, closers, windows in doors, and ADA lever lock hardware (or use specified hardware, keyed locks, magnetic interlocks or as specified on drawings).
- B) All doors shall be clean room compatible and allow for usage in a heavy duty environment.

2.04 Windows:

- A) All windows shall be minimum 3/16" tempered glass and be located and provided in accord with drawings and bill of material listings.
- B) All windows in doors to be minimum 3/16" tempered glass and optional safety glass on heavy usage applications.

2.05 Ceilings:

- A) **Grid:** All clean room ceilings shall be heavy duty clean room specific T-Grid system. Samples and submittal data shall reference class

application and proper usage for grid in this project, in accord with drawings and bill of materials. No standard office grid or grid not specifically designed for clean room work shall be accepted.

- B) **Blank Panels:** All blank panels shall be clean room specific and designed for proper class rating as shown on drawings. Samples and submittal data shall reference class application and proper usage in this project. No standard or off the shelf blank ceiling tiles will be accepted.

- C) **Troffers:** All lighting fixtures shall be clean room specific and designed for proper class ratings as shown on drawings. Samples and submittals data shall reference class application and proper usage for this project. No standard or off the shelf troffers will be accepted.

- D) **HEPA Filters:** HEPA Filters shall be **Halco Brand** at least 99-97% eff @0.3 microns and be as shown on drawings and as listed in bill of materials.

2.06 Walls:

- A) All walls shall be modular factory pre-fabricated 3" thick.
- B) All walls shall be as shown on drawings and as listed on bill of materials.
- C) Post system to be 20 gauge steel painted to match walls and as shown on drawings.

2.07 HVAC System:

- A) Manufacturer shall supply complete HVAC System to maintain specified class, temperature, humidity, and pressure as specified on drawings and as listed in schedules.

- B) System shall include, but not be limited to:

- 1) Packaged heating and cooling system as shown on drawings
- 2) Humidification system and all piping
- 3) Pressurization System
- 4) All supply, return ductwork, insulation, and filters
- 5) Supply and return grills as shown on drawings
- 6) Structural and supports for all equipment
- 7) All process piping
- 8) Complete control, instrumentation system, Magnehelic read out gauges, smoke detector, and local required options.
- 9) Start-up, test, and 1 year
- 10) Clean-up and validation of room

- C) Spare parts to be listed and 2 sets of pre-filters to be provided.

2.08 Specialties:

- A) Provide all specialties as shown on drawings and as listed in schedules.

- B) All specialties shall include, but not be limited to:

- C) Specialties shall include, but not be limited to:
 - 1) Pass-Thru Modules
 - 2) Air Showers
 - 3) Gowning Room Furniture, Tables, and Benches
 - 4) Anti-Static Equipment
 - 5) Equipment, Chillers and Cooling Systems
 - 6) Communication, Paging, and Sound Equipment
 - 7) Central Vacuum Cleaner System
 - 8) Fire Protection, Horns, Sensors, Strobes & All Life Safety equipment.
 - 9) Fire Suppression Sprinklers and Piping
 - 10) Particle Monitoring Systems and On Line Sensing
 - 11) Purge and Decontamination Systems.

Part III: Execution

3.01 Examination:

- A) Verify that area and surfaces are ready to receive and accept unit installation and field dimensions are as shown on drawings prior to starting installation.
- B) Verify that proper required utilities are available and in proper location and ready for use. Any deviations shall be noted prior to starting any work.
- C) Beginning of installation means installer accepts "existing conditions".

3.02 Installation:

- A) Install in accordance with manufacturer's instructions.
- B) Contractor to be qualified clean room contractor with 3 references submitted and approved prior to beginning construction.

3.03 Field Quality Control:

- A) Field inspection and testing will be performed under provisions of general conditions.
- B) Unit to be cleaned tested, and "final validation report" submitted to project manager for files and future reference.

Construction:

- A) Contractor to prepare a project "Gant chart" showing project schedule with milestone dates and clarify with owner prior to beginning any work.
- B) All work shall proceed with contractor's project foreman monitoring progress and advising as to schedules and revisions as required.



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In line with our policy of continual product improvement, HALCO reserves the right to incorporate and use equipment and material to conform with the latest design of its products, and in keeping with the specifications of this equipment.