

SECTION 13036 (13 21 13)

CLEAN ROOMS - MODULAR

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\*\* NOTE TO SPECIFIER \*\* Terra Universal; Critical Environment Equipment.

This section is based on the products of Terra Universal, which is located at:

800 S. Raymond Ave.

Fullerton, CA 92831

Phone: 714-578-6000

Email: [info@TerraUniversal.com](https://arcat.com/rfi?action=email&company=Terra%2BUniversal%2C%2BInc.&message=RE%3A%20Spec%20Question%20(13036ter)%3A%20&coid=43448&spec=13036ter&rep=&fax=714-578-6020)..

Web: www.terrauniversal.com

[[Click Here](https://www.arcat.com/company/terra-universal-inc-43448)] for additional information.

Terra Universal designs, manufactures, and stocks comprehensive lines of cleanrooms, air filtration systems, and cleanroom equipment. Trusted since 1975, Terra Universal has developed and manufactured innovative cleanroom solutions for over 50 years. Combining high-throughput, automated manufacturing and extensive inventory, Terra delivers cleanrooms of any design, size, and complexity with industry-best build times.

Terra builds and installs over 500 cleanrooms per year. All cleanroom components are pre-engineered, quality control tested, and stocked for quick integration and assembly. Terra also offers a wide range of value-add services, including cleanroom installation, structural seismic analysis, expedited production, qualification documentation and extended warranties. Order-specific certificates of compliance document each product's adherence to ISO, UL, OSHA and seismic standards.

The leader in Critical Environment Solutions®, Terra also designs, manufactures, and stocks comprehensive lines of cleanroom components and equipment, including: cleanroom doors and windows, pass through chambers, laminar flow and fume hoods, biosafety cabinets, desiccator cabinets, glove box isolators, cleanroom furniture, and other laboratory equipment.

Industries Served: Pharmaceuticals, Biotechnology, Medical Devices, Medical, Semiconductor, Electronics, Aerospace, Optics/Photonics, General R&D, and other industries requiring precise control of environmental conditions.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. ISO air cleanliness ratings.
    2. BioSafe modular cleanrooms with wall panel system.
    3. BioSafe standalone wall panel system.
    4. Custom hardwall modular cleanrooms.
    5. Custom softwall modular cleanrooms.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. 13 20 00 - Clean Room Pass-Through Chambers.
    2. 23 41 33 - Cleanroom Filtration.
    3. 08 34 00 - Cleanroom Doors.
    4. 08 56 00 - Cleanroom Windows.
    5. Division 23 – HVAC; mechanical services and connections.
    6. Division 26 – Electrical; electrical power service and wiring connections.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM International (ASTM).
    2. Current Good Manufacturing Practice (CGMPP): Regulations enforced by the FDA.
    3. FM Global (FM).
    4. Food and Drug Administration (FDA),
    5. Institute of Environmental Sciences and Technology (IEST).
    6. International Standards Organization (ISO):
       1. ISO 14644-1; Federal Standard 209E.
    7. Underwriters Laboratories (ULus): United States.
    8. Underwriters Laboratories Canada (cUL).
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00.
     2. Product Data:
        1. Manufacturer's data sheets on each product to be used.
        2. Preparation instructions and recommendations.
        3. Storage and handling requirements and recommendations.
        4. Typical installation methods.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: For each finished product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and finish.
    2. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
    3. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of ten years documented experience.
     2. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience with projects of similar scope and complexity.
     3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
  2. PRE-INSTALLATION CONFERENCE
     1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
  3. DELIVERY, STORAGE, AND HANDLING
     1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
     2. Protect from damage due to weather, excessive temperature, and construction operations.
  4. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
  5. WARRANTY
     1. Manufacturer’s standard limited warranty unless indicated otherwise.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Terra Universal, which is located at: 800 S. Raymond Ave., Fullerton, CA 92831; Phone: 714-578-6000; Email: info@TerraUniversal.com; Web: www.terrauniversal.com.

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00.

\*\* NOTE TO SPECIFIER \*\* Delete article not required.

* 1. ISO RATED AIR CLEANLINESS RATINGS

\*\* NOTE TO SPECIFIER \*\* Delete ISO Class designations aka ISO Air Cleanliness Rating not required.

* + 1. Class ISO 14644-1; Federal Standard 209E.
       1. Particle Concentration Designation Definitions:

\*\* NOTE TO SPECIFIER \*\* Delete the following particle concentration designations as required based on ISO Classifications chosen.

* + - * 1. Concentration limits are not applicable due to very high particle concentration.
        2. Sampling and statistical limitations for particles in low concentrations make classification inappropriate.
        3. Sample collection limitations for both particles in low concentrations and sizes greater than 1 micrometer make classification at this particle size inappropriate, due to potential losses in the sampling system.
        4. In order to specify at this particle size in association with ISO Class 5, the macroparticle descriptor M may be adapted and used in conjunction with at least one other particle size.
      1. Air Cleanliness Rating: ISO 8 (Class 100,000):
         1. Maximum Particle Concentration per cu m: .5 micrometer is 3,520,000.
         2. Maximum Particle Concentration per cu m: 1 micrometer is 832,000.
         3. Maximum Particle Concentration per cu m: 5 micrometer: 29,300.
         4. Average Airflow Velocity: 1 to 8 fpm (0.005 to 0.041 mps).
         5. Air Changes per Hour: 5 to 48.
         6. Ceiling Coverage: 5 to 15 percent.
         7. Cleanroom Design: BioSafe® Wall Panel System.
         8. Cleanroom Design: Hardwall.
         9. Cleanroom Design: Softwall.
      2. Air Cleanliness Rating: ISO 7 (Class 10,000):
         1. Maximum Particle Concentration per cu m; .5 micrometer is 352,000.
         2. Maximum Particle Concentration per cu m; 1 micrometer is 83,200.
         3. Maximum Particle Concentration per cu m; 5 micrometer is 2,930.
         4. Average Airflow Velocity: 10 to 15 fpm (0.051 to 0.076 mps).
         5. Air Changes per Hour: 60 to 90.
         6. Ceiling Coverage: 15 to 20 percent.
         7. Cleanroom Design: BioSafe Wall Panel System.
         8. Cleanroom Design: Hardwall.
         9. Cleanroom Design: Softwall.
      3. Air Cleanliness Rating: ISO 6 (Class 1,000):
         1. Maximum Particle Concentration per cu m; .1 micrometer 1,000,000.
         2. Maximum Particle Concentration per cu m; .2 micrometer: 237,000.
         3. Maximum Particle Concentration per cu m; .3 micrometer: 102,000.
         4. Maximum Particle Concentration per cu m; .5 micrometer: 35,200.
         5. Maximum Particle Concentration per cu m; 1 micrometer: 8,320.
         6. Maximum Particle Concentration per cu m; 5 micrometer: 293.
         7. Average Airflow Velocity: 25 to 40 fpm (0.127 to 0.203 mps).
         8. Air Changes per Hour: 150 to 240.
         9. Ceiling Coverage: 25 to 40 percent.
         10. Cleanroom Design: BioSafe Wall Panel System.
         11. Cleanroom Design: Hardwall.
         12. Cleanroom Design: Softwall.
      4. Air Cleanliness Rating: ISO 5 (Class 100):
         1. Maximum Particle Concentration per cu m; .1 micrometer : 100,000.
         2. Maximum Particle Concentration per cu m; .2 micrometer: 23,700.
         3. Maximum Particle Concentration per cu m; .3 micrometer: 10,000.
         4. Maximum Particle Concentration per cu m; .5 micrometer: 3,520.
         5. Maximum Particle Concentration per cu m; 1 micrometer: 832.
         6. Average Airflow Velocity: 40 to 80 fpm (0.203 to 0.406 mps).
         7. Air Changes per Hour: 240 to 480.
         8. Ceiling Coverage: 35 to 70 percent.
         9. Cleanroom Design: BioSafe Wall Panel System.
         10. Cleanroom Design: Hardwall.
         11. Cleanroom Design: Softwall.
      5. Air Cleanliness Rating: ISO 4 (Class 10).
         1. Maximum Particle Concentration per cu m; .1 micrometer: 10,000.
         2. Maximum Particle Concentration per cu m; .2 micrometer: 2,370.
         3. Maximum Particle Concentration per cu m; .3 micrometer: 1,020.
         4. Maximum Particle Concentration per cu m; .5 micrometer: 352.
         5. Maximum Particle Concentration per cu m; 1 micrometer: 83.
         6. Average Airflow Velocity: 50 to 90 fpm (0.254 to 0.457 mps).
         7. Air Changes per Hour: 300 to 540.
         8. Ceiling Coverage: 50 to 90 percent.
         9. Cleanroom Design: BioSafe Wall Panel System.
         10. Cleanroom Design: Hardwall.
      6. Air Cleanliness Rating: ISO 3 (Class 1):
         1. Maximum Particle Concentration per cu m; .1 micrometer: 1,000.
         2. Maximum Particle Concentration per cu m; .2 micrometer: *237*.
         3. Maximum Particle Concentration per cu m; .3 micrometer: 102.
         4. Maximum Particle Concentration per cu m; .5 micrometer: 35.
         5. Average Airflow Velocity: 60 to 90 fpm (0.305 to 0.457 mps).
         6. Air Changes per Hour: 360 to 540.
         7. Ceiling Coverage: 60 to 100 percent.
         8. Cleanroom Design: BioSafe Wall Panel System.

\*\* NOTE TO SPECIFIER \*\* Delete Article not required.

* 1. BIOSAFE MODULAR CLEANROOMS WITH WALL PANEL SYSTEM
     1. Basis of Design:
        1. BioSafe Modular Cleanrooms with Wall Panel System as manufactured by Terra Universal.
        2. Fully integrated turnkey UL-listed cleanroom including wall panels, framing, and filtration.
     2. Standards Compliance:
        1. ISO-14644, GLP, ASTM, IEST, and CGMP grades A, B, C, and D requirements.
        2. cULus Listed, USA and Canada.
        3. FM approved.
     3. Product Characteristics:
        1. Seamless wall panel system. Fully monolithic and flush-mount connecting wall panel system (not a panel-post system with gaps and ledges). Eliminates crevices where microbes colonize.
        2. Scalable design is not limited by overhead clearance, size, shape, or pathways within the site.
        3. Constructed from durable, GMP-rated materials resistant to scratches, corrosion, and common disinfectants such as Spor-Klenz, quaternary and phenolic cleaners  
           Seamless coved transitions between ceiling, walls, and floors allow for easy cleaning.
        4. Sealed joints with cold welded seams.
        5. Panel Plenum Space: Houses utility and filling lines. Users to have convenient access to gas, vacuum and water connections, duplex outlets, control panels, and phone jacks.
        6. Operating Temperature: 140 degrees F (60 degrees C).
        7. Non-flammable.
        8. Resistant to corrosion, moisture, solvents, and disinfectants.
        9. Corner Pieces: Pre-formed and joint-free. No surface flashing or capping.
        10. A level and flush interface between the walls and the finished floor.
            1. Panels are installed onto an adjustable height, recessed channel base.
     4. Wall Panel System:
        1. Wall Panels.
           1. Modular Pre-Fabricated
           2. Standard Panels Size (WxH): 4 x 8 ft (1.219 X 2.438 m).
           3. Panel Thickness: 2 inches (51 mm) nominal.
           4. Standard heights available:

Specified internal height is measured from the floor to filter face. FFUs add 13" (330 mm) overhead clearance to this measurement. To assure proper air flow and installation, allow an additional 11" (280 mm) between the top of the FFUs and the ceiling or other overhead obstruction; a total of 24" (610 mm) between the cleanroom filter face and the surrounding facility ceiling.

\*\* NOTE TO SPECIFIER \*\* Delete height not required.

7’H

8’H

9’H

10’H

12’H

20’H

30’H

40’H

Other:

* + - * 1. Core Material: Aluminum honeycomb.

\*\* NOTE TO SPECIFIER \*\* The uPVC laminate finish ensures a fully flush surface that is robust, easy to clean, and resists common disinfectants, acids, and corrosives.

* + - * 1. Shell Material:

\*\* NOTE TO SPECIFIER \*\* Delete shell material options not required.

uPVC-laminated galvanized steel. 26 ga.

304 stainless steel

316L stainless steel

\*\* NOTE TO SPECIFIER \*\* The following paragraph is optional. Delete option not required.

* + - * 1. Lining Panel: used where cleanroom is installed against existing wall.

\*\* NOTE TO SPECIFIER \*\* Delete panel thickness not required.

Panel thickness: 1/2 inch (13 mm) nominal.

Panel thickness: 1/4 inch (7 mm) nominal.

* + - 1. Cleanroom Windows: As specified in section 08 56 00 - Cleanroom Windows.
         1. Standards Compliance: ISO 14644-1 and cGMP standards.
         2. Glazing: 0.5 inch thick tempered glass pane.
         3. Mounting: Flush to cleanroom wall.
         4. Window Type: Double-pane.

\*\* NOTE TO SPECIFIER \*\* The following paragraphs are optional. Delete options not required.

* + - * 1. Fire-rated.
        2. Switchable smart-glass. Provides instant privacy control with a simple switch.
      1. Modular Walkable Ceiling Systems: Accommodate easy access to equipment installed above the cleanroom and streamlined maintenance operations, such as HEPA filters change-outs.
         1. Maintains a flush, seamless surface for easy wipe-down or spray-down.

\*\* NOTE TO SPECIFIER \*\* Delete support system option not required.

* + - * 1. Support System: Self-Supported. Affix directly to facility flooring with minimal hardware.
        2. Support System: Suspended Turnbuckle Hanger Assembly: Eliminates need for a t-grid structure.
        3. Prefabricated Panels: Seamless wall-to-ceiling integrations.

Standards Compliance: cGMP, GLP, ISO 14664-1 and ASTM standards.

Cutouts: For HEPA-filtered fan units, lighting, sprinkler heads, video cameras, fire alarms, electrical drop, and gas penetrations.

* + - * 1. Panels Size (WxH): 4 x 8 ft (1.219 X 2.438 m).

Panel Thickness: 2 inches (51 mm) nominal.

Core Material: Aluminum honeycomb.

* + - 1. Airflow:

\*\* NOTE TO SPECIFIER \*\* Delete airflow configurations not required.

* + - * 1. Positive pressure, single pass: exhausts through vents at the bottom of wall panels
        2. Positive pressure, recirculating: air exhausts through vents at the bottom of wall panels and is ducted back to fan filter units
        3. Negative pressure, single pass: fan filter units draw air through HEPA filters mounted on the ceiling
      1. Filter Fan Units: As specified in section 23 41 33 - Cleanroom Filtration.
         1. Standards Compliance: UL-listed. ISO-rated. CE marked.

\*\* NOTE TO SPECIFIER \*\* Delete motor, unit, and filter options not required.

* + - * 1. Unit Size: 2’ x 4’.
        2. Unit Size: 4’ x 4’.
        3. Motor Type: Energy saving EC.
        4. Motor Type: AC motors.
        5. Filter Type: HEPA (ISO 5, Class 100 cleanliness requirements).
        6. Filter Type: ULPA (ISO 4, Class 10 cleanliness requirements).
        7. Unit Type: Room-side.
        8. Unit Type: Topside.

\*\* NOTE TO SPECIFIER \*\* Delete paragraph if not required or delete configurations not required.

* + - * 1. Specialty Configurations:

Battery powered.

Integrated LED light.

Integrated ionizer.

Explosion-proof (Class 1/ Division 1).

Reverse flow.

Laminar flow terminal diffusers.

Low profile and narrow footprint designs.

GMP-compliant stainless steel models.

* + - * 1. Control Panels:

Provides convenient, centralized access to monitor and adjust cleanroom controls.

Optimizes cleanroom maintenance, and filter replacement.

Stainless steel.

Separate power switches for lights, blowers, FFUs, are to be included on control panel.

Filter replacement alarm system: Keeps fan filter units working safely and efficiently. Provides automatic replacement alerts to avoid costly and unexpected operational interruptions. Prevents electrical/fire hazards caused by overworked motors pushing against overloaded HEPA filters.

\*\* NOTE TO SPECIFIER \*\* The following items are optional. Delete if not required.

Monitoring system: Temperature, pressure, and relative humidity.

Automated Fan Control System: Simplifies pressure balancing; logs cleanroom pressure, temperature, and humidity for complete environmental validation.

Night Service setting: Energy-saving mode saves 25% of fan operating costs by reducing power consumption during off-hours. Maintains round-the-clock cleanroom integrity at lower cost

* + - * 1. Power Distribution Modules (PDMs):

Powers all FFUs, lights, control panels, and outlets.

Scalable power system completely eliminates hard wiring of electrical components.

Significant cost savings compared to standard, hard-wired systems.

Plug-and-play design speeds up installation. Supports rapid cleanroom installation for time-sensitive projects.

Streamlines room permitting, compliance and certification.

* + - 1. Cleanroom Lighting: LED panels.
         1. Standards Compliance: UL-listed, ISO-rated.
         2. LED Lights: For heat reduction and longer life spans.

\*\* NOTE TO SPECIFIER \*\* The remaining items are optional. Delete options not required.

* + - * 1. Color: White.
        2. Color: Amber.
        3. Color: Red.
        4. Color: Blue.
        5. Emergency Lights: LED, Battery-powered.
        6. Teardrop: For ISO class 4 and 5 environments.
        7. Strip Lighting: For ISO class 4 and 5 environments.
      1. Cleanroom Doors: As specified in Section 08 34 00 - Cleanroom Doors.
         1. Standards Compliance: cGMP, GLP, ASTM and ISO standards.

\*\* NOTE TO SPECIFIER \*\* Delete operation and door type options not required.

* + - * 1. Operation: Manual.
        2. Operation: Automatic.
        3. Door Type: Sliding.
        4. Door Type: Swing-out left.
        5. Door Type: Swing-out right.
        6. Door Type: Bi-parting.
        7. Door Type: Roll-up doors.
        8. Mounting: Flush to the cleanroom wall.
        9. Door Size: As determined from Manufacturer’s standard offerings.

\*\* NOTE TO SPECIFIER \*\* The remaining paragraphs are optional. Delete options not required.

* + - * 1. Fire-rated.
        2. High-speed operation.
        3. Interlocking systems for GMP spaces.
        4. Hermetically-sealed for BSL-rated areas.
        5. Door Windows: Full length.
        6. Door Windows: Partial windows.
      1. Pass-Through Chambers: As specified in Section 13 20 00 - Clean Room Pass-Through Chambers.
         1. Rounded corners and autoclave-safe doors.

\*\* NOTE TO SPECIFIER \*\* Delete mounting options not required.

* + - * 1. Wall-mount. Install flush to the cleanroom wall.
        2. Floor-mount. Install flush to the cleanroom wall.
        3. Interlocks to prevent cross-room contamination.
        4. Seam System: Eliminate crevices where microbes colonize.

\*\* NOTE TO SPECIFIER \*\* The following paragraphs are optional. Delete options not required.

* + - * 1. HEPA Filtration.
        2. Refrigeration.
        3. UV Sterilization.
        4. Automatic, hands-free doors.
        5. Key Card Readers.
        6. Biometric Scanners.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required.

* + 1. Model: 6606-07. Dimensions (WxDxH): 8 x 8 x 8 ft (2.438 x 2.438 x 2.438 m).
       1. Certified ISO Grade Design: ISO 5.
       2. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
    2. Model: 6606-08. Dimensions (WxDxH): 10 x 10 x 8 ft (3.048 x 3.048 x 2.438 m).
       1. Certified ISO Grade Design: ISO 5.
       2. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
    3. Model: 6606-09. Dimensions (WxDxH): 12 x 12 x 8 ft (3.658 x 3.658 x 2.438 m).
       1. Certified ISO Grade Design: ISO 5.
       2. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
    4. Model: 6606-00. Dimensions (WxDxH): \_\_ x \_\_ x \_\_ ft (\_\_ x \_\_ x \_\_ m).
       1. Certified ISO Grade Design: ISO 5.
       2. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
  1. BIOSAFE WALL PANEL SYSTEMS
     1. Basis of Design:
        1. BioSafe prefabricated and demountable wall panel and ceiling system as manufactured by Terra Universal.
     2. Standards Compliance:
        1. ISO-14644, GLP, ASTM, IEST, and CGMP grades A, B, C, and D requirements.
        2. cULus Listed, USA and Canada.
        3. FM approved.
     3. Wall Panel System:
        1. Seamless wall panel system. Fully monolithic and flush-mount connecting wall panel system (not a panel-post system with gaps and ledges). Eliminates crevices where microbes colonize.
        2. Scalable design is not limited by overhead clearance, size, shape, or pathways within the site.
        3. Constructed from durable, GMP-rated materials resistant to scratches, corrosion, and common disinfectants such as Spor-Klenz, quaternary and phenolic cleaners  
           Seamless coved transitions between ceiling, walls, and floors allow for easy cleaning.
        4. Sealed joints with cold welded seams.
        5. Panel Plenum Space: Houses utility and filling lines. Users to have convenient access to gas, vacuum and water connections, duplex outlets, control panels, and phone jacks.
        6. Operating Temperature: 140 degrees F (60 degrees C).
        7. Non-flammable.
        8. Standard Wall Panel Size (WxH): 4 x 8 ft (1.219 X 2.438 m).
           1. Panel Thickness: 2 inches (51 mm) nominal.
           2. Heights available:

Specified internal height is measured from the floor to filter face. FFUs add 13" (330 mm) overhead clearance to this measurement. To assure proper air flow and installation, allow an additional 11" (280 mm) between the top of the FFUs and the ceiling or other overhead obstruction; a total of 24" (610 mm) between the cleanroom filter face and the surrounding facility ceiling.

\*\* NOTE TO SPECIFIER \*\* Delete height not required.

7’H

8’H

9’H

10’H

12’H

20’H

30’H

40’H

Other:

* + - * 1. Core Material: Aluminum honeycomb.
        2. Shell Material:

\*\* NOTE TO SPECIFIER \*\* Delete shell material options not required.

uPVC-laminated galvanized steel. 26 ga.

304 stainless steel

316L stainless steel

\*\* NOTE TO SPECIFIER \*\* The following paragraph is optional. Delete option not required.

* + - 1. Lining Panel: used where cleanroom is installed against existing wall.

\*\* NOTE TO SPECIFIER \*\* Delete panel thickness not required.

* + - * 1. Panel thickness: 1/2 inch (13 mm) nominal.
        2. Panel thickness: 1/4 inch (7 mm) nominal.
    1. Wall Panel System Options:
       1. Cleanroom Windows: As specified in section 08 56 00 - Cleanroom Windows.
          1. Standards Compliance: ISO 14644-1 and cGMP standards.
          2. Glazing: 0.5 inch thick tempered glass pane.
          3. Mounting: Flush to cleanroom wall.
          4. Window Type: Double-pane.

\*\* NOTE TO SPECIFIER \*\* The following paragraphs are optional. Delete options not required.

* + - * 1. Fire-rated.
        2. Switchable smart-glass. Provides instant privacy control with a simple switch.
      1. Modular Walkable Ceiling Systems: Accommodate easy access to equipment installed above the cleanroom and streamlined maintenance operations, such as HEPA filters change-outs.
         1. Maintains a flush, seamless surface for easy wipe-down or spray-down.

\*\* NOTE TO SPECIFIER \*\* Delete support system option not required.

* + - * 1. Support System: Self-Supported. Affix directly to facility flooring with minimal hardware.
        2. Support System: Suspended Turnbuckle Hanger Assembly: Eliminates need for a t-grid structure.
        3. Prefabricated Ceiling Panels: Seamless wall-to-ceiling integrations.

Standards Compliance: cGMP, GLP, ISO 14664-1 and ASTM standards.

Standard Ceiling Panel Size (WxH): 4 x 8 ft (1.219 X 2.438 m).

Panel Thickness: 2 inches (51 mm) nominal.

Core Material: Aluminum honeycomb.

Shell Material: uPVC-laminated galvanized steel. 26 ga.

Cutouts: For HEPA-filtered fan units, lighting, sprinkler heads, video cameras, fire alarms, electrical drop, and gas penetrations.

\*\* NOTE TO SPECIFIER \*\* The uPVC laminate finish ensures a fully flush surface that is robust, easy to clean, and resists common disinfectants, acids and corrosives.

* + - 1. Cleanroom Doors: As specified in Section 08 34 00 - Cleanroom Doors.
         1. Standards Compliance: cGMP, GLP, ASTM and ISO standards.

\*\* NOTE TO SPECIFIER \*\* Delete operation and door type options not required.

* + - * 1. Operation: Manual.
        2. Operation: Automatic.
        3. Door Type: Sliding.
        4. Door Type: Swing-out left.
        5. Door Type: Swing-out right.
        6. Door Type: Bi-parting.
        7. Door Type: Roll-up doors.
        8. Mounting: Flush to the cleanroom wall.
        9. Door Size: As determined from Manufacturer’s standard offerings.

\*\* NOTE TO SPECIFIER \*\* The remaining paragraphs are optional. Delete options not required.

* + - * 1. High-speed operation.
        2. Interlocking systems for GMP spaces.
        3. Hermetically-sealed for BSL-rated areas.
        4. Door Windows: Full length.
        5. Door Windows: Partial windows.
      1. Pass-Through Chambers: As specified in section 13 20 00 - Clean Room Pass-Through Chambers.

\*\* NOTE TO SPECIFIER \*\* Delete mounting options not required.

* + - * 1. Wall-mount. Install flush to the cleanroom wall.
        2. Floor-mount. Install flush to the cleanroom wall.
        3. Interlocks to prevent cross-room contamination.
        4. Seamless interior and rounded corners eliminate crevices where microbes can colonize.

\*\* NOTE TO SPECIFIER \*\* The following paragraphs are optional. Delete options not required.

* + - * 1. Autoclave-safe doors
        2. HEPA Filtration.
        3. Refrigeration.
        4. UV Sterilization.
        5. Automatic, hands-free doors.
        6. Key Card Readers.
        7. Biometric Scanners.

\*\* NOTE TO SPECIFIER \*\* The remaining items are optional. Delete options not required.

The following comprises the most common options. The Manufacturer has a huge catalog of accessories and optional equipment available to meet your unique requirements.

* + 1. Accessories:
       1. HVAC:
          1. Rooftop or floor mounted air conditioning.
          2. Humidifiers.
          3. Dehumidifiers.
       2. Air locks.
       3. Air showers.
       4. DI water, gas, vacuum connections and utilities.
       5. Turnkey Cleanroom Fire Suppression System
       6. Airborne Particle Counters: For accurate readings of cleanrooms and critical environments.
       7. Germicidal UV-C Lamp: Sanitizes labs and cleanrooms. Installs on a ceiling grid for line-of-sight room disinfection. Safety occupancy sensor prevents personnel exposure.
    2. Wall System Model: 6606-50.
       1. Panel Material: uPVC laminated steel exterior.
       2. Core Material: Aluminum honeycomb.
       3. UL: N.
       4. Fire Rating: None.

\*\* NOTE TO SPECIFIER \*\* Delete ISO certification options not required. ISO 5 is standard.

* + - 1. Certified ISO Grade Design: ISO 5.
      2. Certified ISO Grade Design: ISO 6.
      3. Certified ISO Grade Design: ISO 7.
      4. Certified ISO Grade Design: ISO 8.
    1. Wall System Model: 6606-52.
       1. Panel Material: uPVC laminated steel exterior.
       2. Core Material: EPS rigid foam.
       3. UL: N.
       4. Fire Rating: None.

\*\* NOTE TO SPECIFIER \*\* Delete ISO certification options not required. ISO 5 is standard.

* + - 1. Certified ISO Grade Design: ISO 5.
      2. Certified ISO Grade Design: ISO 6.
      3. Certified ISO Grade Design: ISO 7.
      4. Certified ISO Grade Design: ISO 8.
    1. Wall System Model: 6606-53.
       1. Panel Material: 304 stainless steel.
       2. Core Material: Aluminum honeycomb.
       3. UL: N.
       4. Fire Rating: None.

\*\* NOTE TO SPECIFIER \*\* Delete ISO certification options not required. ISO 5 is standard.

* + - 1. Certified ISO Grade Design: ISO 5.
      2. Certified ISO Grade Design: ISO 6.
      3. Certified ISO Grade Design: ISO 7.
      4. Certified ISO Grade Design: ISO 8.
    1. Wall System Model: 6606-54.
       1. Panel Material: 304 stainless steel.
       2. Core Material: EPS rigid foam.
       3. UL: N.
       4. Fire Rating: None.

\*\* NOTE TO SPECIFIER \*\* Delete ISO certification options not required. ISO 5 is standard.

* + - 1. Certified ISO Grade Design: ISO 5.
      2. Certified ISO Grade Design: ISO 6.
      3. Certified ISO Grade Design: ISO 7.
      4. Certified ISO Grade Design: ISO 8.
  1. CUSTOM HARDWALL MODULAR CLEANROOMS
     1. Product Details:
        1. ISO-classified enclosed space with HEPA/ULPA air filtration system.
        2. Electrical Components: UL listed.
           1. UL Listing Declaration available for cleanroom electrical system.
           2. Fan/Filter Units (FFU): As specified in Section 23 41 33 - Cleanroom Filtration.

Standards Compliance: UL-listed. ISO-rated. CE marked.

\*\* NOTE TO SPECIFIER \*\* Delete motor, unit, and filter options not required.

Unit Size: 2’ x 4’.

Unit Size: 4’ x 4’.

Motor Type: Energy saving EC.

Motor Type: AC motors.

Filter Type: HEPA (ISO 5, Class 100 cleanliness requirements).

Filter Type: ULPA (ISO 4, Class 10 cleanliness requirements).

Unit Type: Room-side.

Unit Type: Topside.

\*\* NOTE TO SPECIFIER \*\* Delete paragraph if not required or delete configurations not required.

Specialty Configurations:

Battery powered.

Integrated LED light.

Integrated ionizer.

Explosion-proof (Class 1/ Division 1).

Reverse flow.

Laminar flow terminal diffusers.

Low profile and narrow footprint designs.

GMP-compliant stainless steel models.

* + - * 1. Control Panels:

Provides convenient, centralized access to monitor and adjust cleanroom controls.

Optimizes cleanroom maintenance, and filter replacement.

Stainless steel.

Separate power switches for lights, blowers, FFUs, are to be included on control panel.

Filter replacement alarm system: Keeps fan filter units working safely and efficiently. Provides automatic replacement alerts to avoid costly and unexpected operational interruptions. Prevents electrical/fire hazards caused by overworked motors pushing against overloaded HEPA filters.

\*\* NOTE TO SPECIFIER \*\* The following items are optional. Delete if not required.

Monitoring system: Temperature, pressure, and relative humidity.

Automated Fan Control System: Simplifies pressure balancing; logs cleanroom pressure, temperature, and humidity for complete environmental validation.

Night Service setting: Energy-saving mode saves 25% of fan operating costs by reducing power consumption during off-hours. Maintains round-the-clock cleanroom integrity at lower cost

* + - * 1. Power Distribution Modules (PDMs):

Powers all FFUs, lights, control panels, and outlets.

Scalable power system completely eliminates hard wiring of electrical components.

Significant cost savings compared to standard, hard-wired systems.

Plug-and-play design speeds up installation. Supports rapid cleanroom installation for time-sensitive projects.

Streamlines room permitting, compliance and certification.

* + - * 1. Cleanroom Lighting:

Standards Compliance: UL-listed, ISO-rated.

LED Lights: For heat reduction and longer life spans.

Accommodate any ceiling grid configuration.

Fixed and adjustable color temp

\*\* NOTE TO SPECIFIER \*\* The remaining items are optional. Delete options not required.

Color: White.

Color: Amber.

Color: Red.

Color: Blue.

Emergency Lights: LED, Battery-powered.

Teardrop: For ISO class 4 and 5 environments.

Strip Lighting: For ISO class 4 and 5 environments.

* + - * 1. Status Indicator Lights: Mounted at the top corners of the cleanroom. Glow solid to indicate FFUs are operational; flash when FFUs are off.
      1. Modular Construction: Accommodates custom floor plans and equipment interfaces.
         1. Fully free-standing.
         2. Cleanroom leveling mechanism compensates for small variations in floor level to eliminate need for unsightly floor shims.
         3. All-steel frames and ceiling grids. No external bracing.

Available in 304 or 316L stainless steel, or white powder-coated finish.

\*\* NOTE TO SPECIFIER \*\* The following item is optional. Delete if not required.

Seismic Analysis: Optional seismic and structural calculations can be drafted and stamped by a licensed PE to help meet municipal permitting requirements. Part Number 6600-98.

Frame: Interlocking 2 inch (51 mm) steel square tube

Assembles with standard tools.

Ceiling Grid: supports fan/filter units and LED light panels.

\*\* NOTE TO SPECIFIER \*\* Delete ceiling option not required.

Steel, 3 x 1.5 inch (76 x 38 mm) T-shaped joists, arranged to form 2 x 4 ft (0.610 x 1.219 m) ceiling bays.

Aluminum, suspended.

* + - * 1. Unused Ceiling Bays:

\*\* NOTE TO SPECIFIER \*\* Delete ceiling panel options not required.

Polypropylene ceiling panels: chemical resistant, won’t absorb water or crumble.

Vinyl covered gypsum panels: low-cost, noncombustible, prevents sagging and warping problems. Effective sound absorption.

* + - * 1. Standard heights available:

Specified internal height is measured from the floor to filter face. FFUs add 13" (330 mm) overhead clearance to this measurement. To assure proper air flow and installation, allow an additional 11" (280 mm) between the top of the FFUs and the ceiling or other overhead obstruction; a total of 24" (610 mm) between the cleanroom filter face and the surrounding facility ceiling.

\*\* NOTE TO SPECIFIER \*\* Delete height not required.

7’H

8’H

9’H

10’H

12’H

20’H

30’H

40’H

Other:

* + - * 1. Interchangeable Panels for Quick Install

Wall panels are mounted by clean and attractive mirror-finished stainless steel L-brackets that clamp the panel in place, creating a showcase cleanroom and allowing panel change-out in minutes, with no special tools.

Wall panels include adjustable exhaust vents to help balance differential room pressure to achieve the desired ISO requirements.

\*\* NOTE TO SPECIFIER \*\* Delete mounting option not required.

Wall Panel Mounting: Interior Flush Mount.

Wall Panel Mounting: Center Mount.

* + - 1. Airflow:

\*\* NOTE TO SPECIFIER \*\* Delete airflow configurations not required.

* + - * 1. Positive pressure, single pass: exhausts through vents at the bottom of wall panels
        2. Positive pressure, recirculating: air exhausts through vents at the bottom of wall panels and is ducted back to fan filter units
        3. Negative pressure, single pass: fan filter units draw air through HEPA filters mounted on the ceiling
      1. Panel Materials:

\*\* NOTE TO SPECIFIER \*\* Acrylic is damaged by alcohol and many other cleaning agents. Use only water and mild detergent. Acrylic also generates surface charges that attract and aggregate particles, leading to unpredictable contamination release; select Static-Dissipative PVC for critical static and cleanliness requirements. Delete materials options not required.

* + - * 1. Acrylic: Low cost, high clarity. Not for use with alcohol or other strong cleaning agents.

\*\* NOTE TO SPECIFIER \*\* Delete color options not required.

Color: Clear.

Color: Amber.

* + - * 1. Static-dissipative PVC: Prevents static charges which attract and cause particles to cling to the wall surface; dissipative layers are molecularly embedded for longer useful life (Surface resistivity: 10^7 ohms/sq ft).
        2. Polycarbonate: Resists many common acids, solvents, and cleaning solutions; high tensile strength and shatter-resistant.
        3. Polypropylene: Provides superior resistance to acids and other harsh chemicals; opaque white for privacy.
        4. Tempered Glass: Combines visual clarity with broad chemical resistance and non-porous surfaces for easy sterilization.
      1. Door Design: As specified in Section 08 34 00 - Cleanroom Doors.

\*\* NOTE TO SPECIFIER \*\* Delete door options not required.

* + - * 1. Material: Stainless steel or powder-coated aluminum
        2. Material: Aluminum.
        3. Type: Swinging.
        4. Type: Sliding.
        5. Operation: Manual.
        6. Operation: Electronic.

\*\* NOTE TO SPECIFIER \*\* The remaining items are optional. Delete options not required.

The following comprises the most common options. The Manufacturer has a huge catalog of accessories and optional equipment available to meet your unique requirements.

* + 1. Accessories:
       1. Pass-Through Chambers. As specified in Section 13 20 00 - Clean Room Pass-Through Chambers.
       2. HVAC:
          1. Rooftop or floor mounted air conditioning.
          2. Humidifiers.
          3. Dehumidifiers.
       3. Air locks.
       4. Air showers.
       5. Gowning rooms and antechambers.
       6. Airflow gauges.
       7. DI water, gas, vacuum connections and utilities.
       8. Turnkey Cleanroom Fire Suppression System
       9. BioSafe Hygienic Stainless Steel Crash Rails: Continuous-seam welds for a smooth finish.
       10. Airborne Particle Counters: For accurate readings of cleanrooms and critical environments.
       11. Germicidal UV-C Lamp: Sanitizes labs and cleanrooms. Installs on a ceiling grid for line-of-sight room disinfection. Safety occupancy sensor prevents personnel exposure.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required. Then delete grade design options not required.

* + 1. Model: 6600-63B-SS.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 5.
       4. Certified ISO Grade Design: ISO 6.
       5. Certified ISO Grade Design: ISO 7.
       6. Certified ISO Grade Design: ISO 8.
       7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       8. Frame Material: 304 stainless steel.
       9. Panel Material: Clear acrylic.
       10. Wall Type: Interior flush mount.
    2. Model: 6600-64A-SS.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 5.
       4. Certified ISO Grade Design: ISO 6.
       5. Certified ISO Grade Design: ISO 7.
       6. Certified ISO Grade Design: ISO 8.
       7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       8. Frame Material: 304 stainless steel.
       9. Panel Material: Polycarbonate.
       10. Wall Type: Center mount.
    3. Model: 6600-64B-SS.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 5.
       4. Certified ISO Grade Design: ISO 6.
       5. Certified ISO Grade Design: ISO 7.
       6. Certified ISO Grade Design: ISO 8.
       7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       8. Frame Material: 304 stainless steel.
       9. Panel Material: Polycarbonate.
       10. Wall Type: Interior flush mount.
    4. Model: 6600-69A-SS.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 5.
       4. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       5. Frame Material: 304 stainless steel.
       6. Panel Material: Tempered glass.
       7. Wall Type: Center mount.
    5. Model: 6600-69B-SS.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 5.
       4. Certified ISO Grade Design: ISO 6.
       5. Certified ISO Grade Design: ISO 7.
       6. Certified ISO Grade Design: ISO 8.
       7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       8. Frame Material: 304 stainless steel.
       9. Panel Material: Tempered glass.
       10. Wall Type: Interior flush mount.
    6. Model: 6600-68A-SS.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 5.
       4. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       5. Frame Material: 304 stainless steel.
       6. Panel Material: Polypropylene.
       7. Wall Type: Center mount.
    7. Model: 6600-68B-SS.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 5.
       4. Certified ISO Grade Design: ISO 6.
       5. Certified ISO Grade Design: ISO 7.
       6. Certified ISO Grade Design: ISO 8.
       7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       8. Frame Material: 304 stainless steel.
       9. Panel Material: Polypropylene.
       10. Wall Type: Interior flush mount.
    8. Model: 6600-73A-SS.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 5.
       4. Certified ISO Grade Design: ISO 6.
       5. Certified ISO Grade Design: ISO 7.
       6. Certified ISO Grade Design: ISO 8.
       7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       8. Frame Material: 304 stainless steel.
       9. Panel Material: Static-Dissipative PVC.
       10. Wall Type: Center mount.
    9. Model: 6600-73B-SS.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 5.
       4. Certified ISO Grade Design: ISO 6.
       5. Certified ISO Grade Design: ISO 7.
       6. Certified ISO Grade Design: ISO 8.
       7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       8. Frame Material: 304 stainless steel.
       9. Panel Material: Static-Dissipative PVC.
       10. Wall Type: Interior flush mount.
    10. Model: 6600-73A-4910.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated teel.
        9. Panel Material: CDPVC.
        10. Wall Type: Interior flush mount.
    11. Model: 6600-73-4910.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: CDPVC.
        10. Wall Type: Center mount.
    12. Model: 6600-63A.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated stainless steel.
        9. Panel Material: Clear Acrylic.
        10. Wall Type: Center mount.
    13. Model: 6600-63B.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: Clear Acrylic.
        10. Wall Type: Interior flush mount.
    14. Model: 6600-64A.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: Polycarbonate.
        10. Wall Type: Center mount.
    15. Model: 6600-64B.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: Polycarbonate.
        10. Wall Type: Interior flush mount.
    16. Model: 6600-69A.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: Tempered glass.
        10. Wall Type: Center mount.
    17. Model: 6600-69B.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: Tempered glass.
        10. Wall Type: Interior flush mount.
    18. Model: 6600-68A-4910.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: White Polypropylene.
        10. Wall Type: Interior flush mount.
    19. Model: 6600-68-4910.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: White Polypropylene.
        10. Wall Type: Center mount.
    20. Model: 6600-68A.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: Polypropylene.
        10. Wall Type: Center mount.
    21. Model: 6600-68B.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: Polypropylene.
        10. Wall Type: Interior flush mount.
    22. Model: 6600-73A.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: Static Dissipative PVC.
        10. Wall Type: Center mount.
    23. Model: 6600-73B.
        1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
        2. Dimensions: As designated on the Drawings.
        3. Certified ISO Grade Design: ISO 5.
        4. Certified ISO Grade Design: ISO 6.
        5. Certified ISO Grade Design: ISO 7.
        6. Certified ISO Grade Design: ISO 8.
        7. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
        8. Frame Material: Power-coated steel.
        9. Panel Material: Static Dissipative PVC.
        10. Wall Type: Interior flush mount.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required, or delete model not required, then dimensions and grade design options not required.

* 1. CUSTOM SOFTWALL MODULAR CLEANROOMS
     1. Product Details:
        1. ISO-classified enclosed space with HEPA/ULPA air filtration system.
        2. Electrical Components: UL listed.
           1. UL Listing Declaration available for cleanroom electrical system.
           2. Fan/Filter Units (FFU): As specified in Section 23 41 33 - Cleanroom Filtration.

Standards Compliance: UL-listed. ISO-rated. CE marked.

\*\* NOTE TO SPECIFIER \*\* Delete motor, unit, and filter options not required.

Unit Size: 2’ x 4’.

Unit Size: 4’ x 4’.

Motor Type: Energy saving EC.

Motor Type: AC motors.

Filter Type: HEPA (ISO 5, Class 100 cleanliness requirements).

Filter Type: ULPA (ISO 4, Class 10 cleanliness requirements).

Unit Type: Room-side.

Unit Type: Topside.

\*\* NOTE TO SPECIFIER \*\* Delete paragraph if not required or delete configurations not required.

Specialty Configurations:

Battery powered.

Integrated LED light.

Integrated ionizer.

Explosion-proof (Class 1/ Division 1).

Reverse flow.

Laminar flow terminal diffusers.

Low profile and narrow footprint designs.

GMP-compliant stainless steel models.

* + - * 1. Control Panels:

Provides convenient, centralized access to monitor and adjust cleanroom controls.

Optimizes cleanroom maintenance, and filter replacement.

Stainless steel.

Separate power switches for lights, blowers, FFUs, are to be included on control panel.

Filter replacement alarm system: Keeps fan filter units working safely and efficiently. Provides automatic replacement alerts to avoid costly and unexpected operational interruptions. Prevents electrical/fire hazards caused by overworked motors pushing against overloaded HEPA filters.

\*\* NOTE TO SPECIFIER \*\* The following items are optional. Delete if not required.

Monitoring system: Temperature, pressure, and relative humidity.

Automated Fan Control System: Simplifies pressure balancing; logs cleanroom pressure, temperature, and humidity for complete environmental validation.

Night Service setting: Energy-saving mode saves 25% of fan operating costs by reducing power consumption during off-hours. Maintains round-the-clock cleanroom integrity at lower cost

* + - * 1. Power Distribution Modules (PDMs):

Powers all FFUs, lights, control panels, and outlets.

Scalable power system completely eliminates hard wiring of electrical components.

Significant cost savings compared to standard, hard-wired systems.

Plug-and-play design speeds up installation. Supports rapid cleanroom installation for time-sensitive projects.

Streamlines room permitting, compliance and certification.

* + - * 1. Cleanroom Lighting:

Standards Compliance: UL-listed, ISO-rated.

LED Lights: For heat reduction and longer life spans.

Accommodate any ceiling grid configuration.

Fixed and adjustable color temp

\*\* NOTE TO SPECIFIER \*\* The remaining items are optional. Delete options not required.

Color: White.

Color: Amber.

Color: Red.

Color: Blue.

Emergency Lights: LED, Battery-powered.

Teardrop: For ISO class 4 and 5 environments.

Strip Lighting: For ISO class 4 and 5 environments.

* + - * 1. Status Indicator Lights: Mounted at the top corners of the cleanroom. Glow solid to indicate FFUs are operational; flash when FFUs are off.
      1. Modular Construction
         1. Fully free-standing.
         2. Frame: Interlocking 2.5 inch (63.5 mm) steel frame with corner gussets for rigidity.

Ceiling grid supports fan/filter units and LED light panels.

Configure ceiling grid with lights and fan/filters to meet ISO 5 - 8 particle requirements.

* + - * 1. Unused Ceiling Bays:

\*\* NOTE TO SPECIFIER \*\* Delete ceiling panel options not required.

Polypropylene ceiling panels: chemical resistant, won’t absorb water or crumble.

Vinyl covered gypsum panels: low-cost, noncombustible, prevents sagging and warping problems. Effective sound absorption.

* + - * 1. Standard heights available:

Specified internal height is measured from the floor to filter face. FFUs add 13" (330 mm) overhead clearance to this measurement. To assure proper air flow and installation, allow an additional 11" (280 mm) between the top of the FFUs and the ceiling or other overhead obstruction; a total of 24" (610 mm) between the cleanroom filter face and the surrounding facility ceiling.

\*\* NOTE TO SPECIFIER \*\* Delete height not required.

7’H

8’H

9’H

10’H

12’H

20’H

30’H

40’H

Other:

* + - * 1. Interchangeable Softwall Panels: Heavy-duty, blur-free 40-mil static-dissipative vinyl for tear resistance.

Where two panels meet, the panels are to overlap by 2 inches (51 mm).

Panel Seams: Can be fastened closed.

\*\* NOTE TO SPECIFIER \*\* Delete fastening system option not required.

Fastening System: Dual-Lock, magnetic closures.

Fastening System: Attachment clips.

* + - 1. Curtain Panel and Strip Shield Materials

\*\* NOTE TO SPECIFIER \*\* Delete materials not required.

* + - * 1. Material: Anti-static PVC, 40 mil
        2. Material: Polysim, Class 1 Fire-Rated, 40 mil
        3. Size: 8 inch (203 mm) wide
        4. Size: 12 inch (305 mm) wide
        5. Size: 48 inch (1219 mm) wide
      1. Airflow:

\*\* NOTE TO SPECIFIER \*\* Delete airflow configurations not required.

* + - * 1. Positive pressure, single pass: exhausts through vents at the bottom of wall panels
        2. Negative pressure, single pass: fan filter units draw air through HEPA filters mounted on the ceiling

\*\* NOTE TO SPECIFIER \*\* The remaining items are optional. Delete options not required.

The following comprises the most common options. The Manufacturer has a huge catalog of accessories and optional equipment available to meet your unique requirements.

* + 1. Accessories:
       1. Heavy-Duty Cleanroom Grade Locking Casters: Allows repositioning of unit. Stainless steel swivel casters with non-shedding polyurethane wheels.
       2. Gowning rooms and Antechambers.
       3. Airflow gauges.
       4. DI water, gas, vacuum connections and utilities.
       5. Turnkey Cleanroom Fire Suppression System
       6. Airborne Particle Counters: For accurate readings of cleanrooms and critical environments.
       7. Germicidal UV-C Lamp: Sanitizes labs and cleanrooms. Installs on a ceiling grid for line-of-sight room disinfection. Safety occupancy sensor prevents personnel exposure.

\*\* NOTE TO SPECIFIER \*\* Delete model options not required. Then delete grade design options not required.

* + 1. Model: 6600-61.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 6.
       4. Certified ISO Grade Design: ISO 7.
       5. Certified ISO Grade Design: ISO 8.
       6. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       7. Frame Material: 304 stainless steel.
    2. Model: 6600-60.
       1. Dimensions (WxDxH): \_\_\_ X \_\_\_ X \_\_\_ ft (\_\_\_ X \_\_\_ X \_\_\_ m).
       2. Dimensions: As designated on the Drawings.
       3. Certified ISO Grade Design: ISO 6.
       4. Certified ISO Grade Design: ISO 7.
       5. Certified ISO Grade Design: ISO 8.
       6. ISO Air Cleanliness Rating: \_\_\_\_\_\_\_\_.
       7. Frame Material: Powder-coated steel.

1. EXECUTION.
   1. EXAMINATION
      1. Do not begin installation until the substrates have been properly constructed and prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   3. INSTALLATION
      1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
   4. FIELD QUALITY CONTROL
      1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer’s Services: Coordinate manufacturer’s services in accordance with appropriate sections in Division 01.
  1. CLEANING AND PROTECTION
     1. Clean products in accordance with the manufacturer’s recommendations.
     2. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION