SECTION 08 56 00

CLEANROOM WINDOWS

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\*\* NOTE TO SPECIFIER \*\* Terra Universal, Inc.; Cleanroom windows and accessory products.  
.  
This section is based on the products of Terra Universal, Inc., which is located at:  
800 S. Raymond Ave.  
Fullerton, CA 92381-5234  
Tel: 714-578-6000  
Fax: 714-578-6020  
Email: [request info (info@TerraUniversal.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Terra+Universal,+Inc.&coid=43448&rep=&fax=714-578-6020&message=RE:%20Spec%20Question%20(08580ter):%20%20&mf=)  
Web: <https://www.terrauniversal.com>   
 [ [Click Here](http://www.arcat.com/arcatcos/cos43/arc43448.html) ] for additional information.  
Terra Universal is the leading manufacturing expert in critical environment applications, with over 30 years of design and fabrication experience in cleanroom-related industries.  
In addition to standard manufactured products, Terra customizes to unique requirements. Installation and certification services for modular cleanrooms, filtration, doors and glove box isolators are also available.  
This specification includes Cleanroom Windows and accessories.

1. GENERAL
   1. SECTION INCLUDES

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

* + 1. Custom Size Cleanroom Windows.
  1. RELATED SECTIONS

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

* + 1. Section 05 50 00 - Metal Fabrications.
    2. Section 07 90 00 - Joint Protection.
    3. Section 08 30 00 - Specialty Doors and Frames.
    4. Section 08 71 00 - Door Hardware.
    5. Section 08 30 00 - Specialty Doors and Frames.
    6. Division 15 - HVAC; mechanical services and connections.
    7. Division 16 - 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. FS 209E - Cleanroom and Workstation Requirements, Controlled Environments.
    2. ISO 146744-1 - Cleanrooms and associated controlled environmentsPart 1: Classification of air cleanliness
    3. UL (Underwriters Laboratories, Inc.) - Electrical Appliance and Utilization Equipment Directory.
    4. FDA/cGMP Requirements - 21 CFR Section 211 and Proposed Guidelines 21 CFR Section 212.
  1. DESIGN REQUIREMENTS
     1. Cleanroom Window Types:

\*\* NOTE TO SPECIFIER \*\* Edit the following Cleanroom Window Types to include those that are specified and delete those not required.

* + - 1. BioSafe Framed, Single-Sided: Includes one window pane installed on one side of the frame. Stainless steel frame fits flush on both sides of the wall surface, minimizing crevices where contaminants can collect. Designed for quick, easy installation in a variety of wall materials and thicknesses. Mounting system reduces fasteners for a showcase appearance.
      2. BioSafe Framed, Double-Sided: Includes two window panes, each installed on opposite sides of the frame. Stainless steel frame fits flush on both sides of the wall surface, minimizing crevices where contaminants can collect. Designed for quick, easy installation in a variety of wall materials and thicknesses. Mounting system reduces fasteners for a showcase appearance.
      3. BioSafe Frameless, Single-Sided: Frameless cleanroom window is completely flush with wall surface on one side. Glass pane on one side is recessed into the wall to create a seamless, smooth, easy-clean surface. Attractive black faux border is part of the glass window, positioned on the inside surface so it can't scratch or degrade over time. The opposite side of the window is a stainless steel frame fits that fits flush on the wall surface, minimizing crevices where contaminants can collect. Designed for quick, easy installation in a variety of wall materials and thicknesses. Mounting system reduces fasteners for a showcase appearance.
      4. BioSafe Frameless, Double-Sided: Frameless cleanroom windows are completely flush with wall surface on both sides side. Glass panes on both sides are recessed into the wall to create a seamless, smooth, easy-clean surface. Attractive black faux borders are part of the glass windows, positioned on the inside surfaces so it can't scratch or degrade over time. Designed for quick, easy installation in a variety of wall materials and thicknesses. Mounting system reduces fasteners for a showcase appearance.
      5. ValuLine, Single-Sided: Window pane on one side is recessed into the wall to create a smooth, easy-clean surface The opaque white polypropylene frame installs flush on both sides of the wall surface, minimizing crevices where contaminants can collect. Designed for quick, easy installation in a variety of wall materials and thicknesses. Mounting system reduces fasteners for a showcase appearance.
      6. ValuLine, Double-Sided: Window panes on both sides are recessed into the wall to create a smooth, easy-clean surface The opaque white polypropylene frame installs flush on both sides of the wall surface, minimizing crevices where contaminants can collect. Designed for quick, easy installation in a variety of wall materials and thicknesses. Mounting system reduces fasteners for a showcase appearance.
  1. DESIGN / PERFORMANCE REQUIREMENTS

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required for the project.

* + 1. Cleanroom Windows shall be capable of maintaining the following cleanroom performance requirements when installed as follows.
       1. Capable of maintaining Class 100 to 10,000 (ISO 5 to ISO 8) conditions in accordance with FS 209E and ISO 146744-1.
       2. Capable of meeting validation requirements of FDA/cGMP and the following requirements.
          1. Nonviability Particle Count: Maximum of 10,000 per cf, 0.5 micron or larger measured 6 inches above work surface (Class 10,000/ISO 7). Other permissible counts accord with nominal cleanliness rating (1000 per cf. for ISO 6, 100 per cf. for ISO 5).
          2. Viable Count: Less than 1.5 colony forming units per 10 cubic feet. Other permissible counts in accord with nominal cleanliness rating.
       3. Capable of maintaining a passive pressure differential of:
          1. Area outside room: balance condition
          2. Air lock: 0.05 inch w.g.
          3. Cleanroom: 0.1 inch w.g.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Preparation instructions and recommendations.
        2. Storage and handling requirements and recommendations.
        3. Installation methods.
     3. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and finish.
     4. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
  2. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Company specializing in the manufacture of products specified in this section with minimum 10 years documented experience.
     2. Installer Qualifications: Company specializing in performing work of this section with minimum 5 years documented experience.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
       1. Locate where designated by Architect.
       2. Do not proceed with remaining work until workmanship and finish are approved by Architect.
       3. Refinish mock-up area as required to produce acceptable work.
       4. Accepted mock-ups shall be comparison standard for remaining Work
    2. Preinstallation Meetings: Conduct meeting to verify project requirements, substrate conditions, utility connections, manufacturer's installation instructions.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Store products in manufacturer's unopened packaging until ready for installation.
     2. Do not deliver materials or assemblies to site until installation spaces are ready to receive units.
  2. SEQUENCING
     1. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
     2. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Terra Universal, Inc., which is located at: 800 S. Raymond Ave.; Fullerton, CA 92381-5234; Tel: 714-578-6000; Fax: 714-578-6020; Email: [request info (info@TerraUniversal.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Terra+Universal,+Inc.&coid=43448&rep=&fax=714-578-6020&message=RE:%20Spec%20Question%20(08580ter):%20%20&mf=); Web: <https://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 provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Select the cleanroom windows required from the following paragraphs. Delete the paragraphs that are not applicable.

* 1. CUSTOM SIZE CLEANROOM WINDOWS

\*\* NOTE TO SPECIFIER \*\* Select the Custom Window Area, Type, Wall Thickness and Glazing as required from the following paragraphs and delete those not required.

* + 1. BioSafe Stainless Steel Frameless Windows Custom Sizes:
       1. Window Area: 9 SF and smaller:
          1. Type:

Frameless Single-Sided:

Frameless Double-Sided:

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Fire Rated Glass 0.1875 inches thick, with a maximum pane area of 23.3 SF and a maximum size of 47 inches by 71 inches.

* + - 1. Window Area: 9 to 12 SF:
         1. Type:

Frameless Single-Sided:

Frameless Double-Sided:

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Fire Rated Glass 0.1875 inches thick, with a maximum pane area of 23.3 SF and a maximum size of 47 inches by 71 inches.

* + - 1. Window Area: 12 to 16 SF:
         1. Type:

Frameless Single-Sided:

Frameless Double-Sided:

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Fire Rated Glass 0.1875 inches thick, with a maximum pane area of 23.3 SF and a maximum size of 47 inches by 71 inches.

* + - 1. Window Area: 16 to 20 SF:
         1. Type:

Frameless Single-Sided:

Frameless Double-Sided:

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Fire Rated Glass 0.1875 inches thick, with a maximum pane area of 23.3 SF and a maximum size of 47 inches by 71 inches.

* + - 1. Window Area: 20 to 40 SF:
         1. Type:

Frameless Single-Sided:

Frameless Double-Sided:

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Fire Rated Glass 0.1875 inches thick, with a maximum pane area of 23.3 SF and a maximum size of 47 inches by 71 inches.

* + 1. BioSafe Stainless Steel Framed Windows Custom Sizes:
       1. Window Area: 9 SF and smaller:
          1. Type:

Framed, Single-Sided Window

Framed, Double-Sided Window

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Fire Rated Glass 0.1875 inches thick, with a maximum pane area of 23.3 SF and a maximum size of 47 inches by 71 inches.

Polycarbonate 0.5 inches thick, with a maximum pane area of 40 SF.

* + - 1. Window Area: 9 to 12 SF:
         1. Type:

Framed, Single-Sided Window

Framed, Double-Sided Window

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Fire Rated Glass 0.1875 inches thick, with a maximum pane area of 23.3 SF and a maximum size of 47 inches by 71 inches.

Polycarbonate 0.5 inches thick, with a maximum pane area of 40 SF.

* + - 1. Window Area: 12 to 16 SF:
         1. Type:

Framed, Single-Sided Window

Framed, Double-Sided Window

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Fire Rated Glass 0.1875 inches thick, with a maximum pane area of 23.3 SF and a maximum size of 47 inches by 71 inches.

Polycarbonate 0.5 inches thick, with a maximum pane area of 40 SF.

* + - 1. Window Area: 16 to 20 SF:
         1. Type:

Framed, Single-Sided Window

Framed, Double-Sided Window

* + - * 1. Wall Thickness:

12 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

410 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Fire Rated Glass 0.1875 inches thick, with a maximum pane area of 23.3 SF and a maximum size of 47 inches by 71 inches.

Polycarbonate 0.5 inches thick, with a maximum pane area of 40 SF.

* + - 1. Window Area: 20 to 40 SF:
         1. Type:

Framed, Single-Sided Window

Framed, Double-Sided Window

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Fire Rated Glass 0.1875 inches thick, with a maximum pane area of 23.3 SF and a maximum size of 47 inches by 71 inches.

Polycarbonate 0.5 inches thick, with a maximum pane area of 40 SF.

* + 1. ValueLine Polypropylene Framed Windows Custom Sizes:
       1. Window Area: 9 SF and smaller:
          1. Type:

Framed, Single-Sided Window

Framed, Double-Sided Window

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Polycarbonate 0.5 inches thick, with a maximum pane area of 40 SF.

* + - 1. Window Area: 9 to 12 SF and smaller:
         1. Type:

Framed, Single-Sided Window

Framed, Double-Sided Window

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Polycarbonate 0.5 inches thick, with a maximum pane area of 40 SF.

* + - 1. Window Area: 12 to 16 SF and smaller:
         1. Type:

Framed, Single-Sided Window

Framed, Double-Sided Window

* + - * 1. Wall Thickness:

2 - 3.9 inches

4 - 5.9 inches

6 - 9.9 inches

10 inches plus

* + - * 1. Glazing:

Tempered Glass 0.5 inch and 0.25 inch thick, with a maximum pane area of 40 SF.

Polycarbonate 0.5 inches thick, with a maximum pane area of 40 SF.

1. EXECUTION
   * 1. Do not begin installation until window openings and substrates have been properly prepared.
     2. Verify exact location of clean room windows for installation.
     3. Verify that rough openings and surfaces are ready to receive work.
     4. If opening and substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   1. 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. Provide templates and rough-in measurements as required.
   2. INSTALLATION
      1. Install in accordance with manufacturer's instructions.
      2. Install windows, plumb and level. Seal the perimeter of both sides of the opening as required.
   3. PROTECTION
      1. Protect installed products until completion of project.
      2. Touch-up, repair or replace damaged products before Substantial Completion.
   4. SCHEDULES

\*\* NOTE TO SPECIFIER \*\* Retain Paragraph below if required to suit project requirements. Identify products by name on the Drawings or use this paragraph to define the location of each type of material to be used. Edit as required to suit project or delete and identify products on the Drawings.

* + 1. :
    2. :

END OF SECTION