



**CHANNEL SYSTEMS, INC.  
CG-8200 2" & CG-225 2.25" TECH GRID SPECIFICATION  
CLEAN ROOM CEILING SYSTEMS**

**Part 1 General**

**1.01 SECTION INCLUSIONS**

A. Section shall include provision of materials, hardware, installation, supervision and testing, complete in all aspects necessary of operation of Laminar flow Ceiling Systems.

B. Systems shall include T-bar Ceiling Grid System, Ceiling Grid Support System, blank pans, seats, gasket tape and light fixtures as specified in Division 15.

C. System shall include sealing of all penetrations including fire sprinklers, electrical lines, etc.

D. System installation shall include electrical connection to the building electrical system and lighting on emergency power systems.

**1.02 RELATED SECTIONS**

A. Cleanroom Partition Systems: Section 13063

B. Cleanroom Product Outgassing: Section 01722

C. General Cleanroom Construction Procedures: Section 01723

D. Construction Cleanroom Protocol: Section 01724

E. Lighting: Section 16510

**1.03 REFERENCES**

The following documents form a part of these specifications to the extent stated herein.

American Society for Testing and Materials (ASTM)

ASTM A 36      Carbon Structural Steel

ASTM A 193      Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service

ASTM A 307      Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

ASTM A 563	Carbon and Alloy Steel Nuts
ASTM A 570	Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality
ASTM A 575	Steel Bars, Carbon, Merchant Quality, M-Grades
ASTM A 576	Steel Bars, Carbon, Hot-Wrought, Special Quality
ASTM A 635	Steel, Sheet and Strip, Heavy-Thickness coils, Carbon, Hot-Rolled
ASTM B 209	Aluminum Alloy Sheet and Plate
ASTM B 221	Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes
ASTM B 633	Electrodeposited Coatings of Zinc on Iron and Steel

American Welding Society (AWS)

AWS D1.1	Structural Welding Code
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Federal Standards (FED STD)

FED STD 209E	Airborne Particulate Cleanliness Classes in Cleanrooms and Clean Zone
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International Conference of Building Officials (ICBO)

ICBO UBC	Uniform Building Code
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#### 1.04 PERFORMANCE

A. The resultant Ceiling System shall be capable of providing cleanroom class conditions indicated for the specific area installed.

1. Suspended ceiling grid system, with lights, filters, ceiling panels

a. Ceiling System Loading:

Dead Load: Total dead load of grid system shall not exceed 8 lbs./sq.ft.

System Live Load: Maximum allowable uniform load shall be 48 lbs./sq.ft.

Concentrated Load: Maximum allowable concentrated load is 215 lbs.

The maximum allowable concentrated load with 220 lb. live load included, is 21 lbs.

The maximum allowable uniform load with 220 lb. live load included is 3.6 lbs./sq.ft.

b. Deflection: Limit to L/360 of span.

c. Lateral resistance: System shall resist lateral forces in compliance with Appendix G.

B. The work supplied pursuant to this Section shall be in conformance with the following, except as modified herein:

1. ISO 141466-1 FOR CLEANROOMS.

2. IEEE Test Procedure 112A

3. ASHREA Test Standard 52-76

C. All electrical components shall be UL listed and labeled.

D. Cleanroom ceiling system shall be installed as required by the UBC for Chapter 16 Seismic Zone 4.

#### 1.05 SUBMITTALS

A. Submit shop drawings, calculations, product data, samples and certificates under provisions of Section 01300.

B. Shop Drawings: submit complete shop drawings and erection diagrams. Shop drawings shall be prepared by the Ceiling System manufacturer. Show details of all finished work as indicated on drawings including the following items: attachments, seismic restraint and uplift details, anchorages, reinforcements, assemblies, and closing connections between members and with adjacent construction, locations of all joints, joinery techniques and materials, fastening and sealing methods, and sealant materials and sealant systems. Identify all materials, including metal alloys, fasteners, and all shop and field sealants by product name and locate them on shop drawings. Shop drawings shall include instructions and explanatory details for the sequence of installation of all materials. Show relative layout of all adjacent construction all correctly dimensioned. Provide isometric or other drawings which explain or define certain interconnections.

C. Calculations: Performed and sealed by a California-licensed civil or structural engineer for the structural framing system, framing spacing, connections, all framing components and seismic bracing.

D. Product Data: Submit manufacturer's literature, technical specifications, standard details, and installation recommendation for components of structural framing system and modular grid system, including test reports certifying that products have been tested and comply with performance requirements.

E. Provide samples of all finishes. Accepted samples will become the standard for acceptance of all installed work.

#### 1.06 QUALITY ASSURANCE

A. Factory Observation: Owner shall have the right to maintain a quality control representative at the factory to observe fabrication, assembly, and testing of all parts of the cleanroom ceiling systems. The owner's representative shall have access to all areas as required for complete observation of all stages of manufacturing and testing. The system manufacturer shall provide the schedule of component manufacturing for coordination of factory observation.

B. Installer Qualifications: Installation shall be by material manufacturer of manufacturer's approved, qualified, and authorized installer with at least 5 years of experience on similar construction.

#### 1.07 TRANSPORTATION AND PROTECTION

A. Delivery: Materials should not be delivered to project until work which may affect performance of cleanroom systems has been completed. Grid systems should be delivered in unopened packaging to prevent transit and construction dust contamination. Packaging should be removed outside of cleanroom area.

B. Storage: Materials should be stored within building in enclosed space designated for cleanroom component storage. Materials should be stored in a manner as to prevent damage or intrusion of foreign matter. Materials that are damaged should be marked as rejected and removed from the jobsite. Materials should be protected from impact, excessive moisture, or other damaging elements. Store in clean, dry location with adequate air circulation.

#### 1.08 WARRANTY

A. Upon completion of testing and documentation of Substantial Completion, a two year warranty service agreement will take effect. During this period, the cleanroom installer shall be responsible for providing replacement parts and/or labor (at no cost to the owner) should failure of air seal occur.

#### 1.09 MAINTENANCE STOCK

A. Extra material: deliver 1/2 percent of grid and accessories to the owner at completion of work.

### **Part 2 Products**

#### 2.01 ACCEPTABLE MANUFACTURERS

A. The following are acceptable grid manufacturers:

1. Channel Systems, Inc. 74 98<sup>TH</sup> AVE OAKLAND, CA. 94603 (510) 568 7170, www.channelsystems.com.

2.02 COMPONENTS FOR ALUM. 2" TECH GRID: GASKETED SYSTEM SERIES 6200 OR 8200 and 2.25" WIDE x 5.25" HIGH CG-225: FOR CLEANROOM CLASSES ISO 1-8, USE WITH INDIVIDUALLY DUCTED HEPA/UPLA FILTERS AND/OR MOTORIZED FAN FILTER UNITS.

A. Field-assembled "T"-bar gasketed ceiling system

1. The system shall be manufactured from stick built modular units of "T" and "L" shaped components and shall be field assembled or pre-welded at the factory in sections. Connections shall be spliced together with 1/4" thick steel fittings or 3/4" thick alum. fittings. Suspension shall be supported from the structure above by 3/8" rod with threaded ends, 8 to 12" inch long left/right 3/8" rod drops, and 3/8" turnbuckles( 4,800lb pull out). All splices between grid members shall occur at grid intersections.
2. Face profile of bottom of CG 6200 and CG 8200 T-grid shall not exceed 2 inches wide and L-grid members shall not exceed 2" inches wide. Flanges of grid are to be minimum 1/8" thick. CG-225 shall not exceed 2.25" wide. Flanges to be 1/8" thick.
3. Field assembled framing systems shall be sealed at all intersections to provide an air and light-tight condition. Use the cleanroom sealant specified in Section 07920.
4. Gaskets: 1/8 inch x 3/8 inch Urethane or Poron shall be pre-cut to the exact size and installed in continuous pieces (corner to corner) and in straight lines along filter frame face.
5. The finish of the ceiling system shall be the manufacturer's standard White epoxy powder coat, White polyester/epoxy hybrid, CL Anodized 204R1 Finish, or custom type of paint and color as selected by arch.
6. The total weight of the Framing System (including ULPA filters and fluorescent lighting troffers) shall not exceed an average of 10 pounds per square foot.
7. Filter clamping shall be accomplished by static or spring-loaded locking fasteners. An extended portion of the fastener shall "lock" against the frame of the HEPA/ULPA filter and when properly torqued, maintaining a continuous even pressure on the HEPA/ULPA filter to compensate for the compression set of the filter gasket. Gasket compression shall be uniform 50 percent.
8. Suspension spacing for either system shall be as required for the dead load of the ceiling system and live loads per structural eng. requirements and all applicable codes.
9. Sprinkler penetrations shall be made through grid intersections or through filler panels in the ceiling grid and are to be factory furnished. Sprinkler contractor shall rough-in and complete the sprinkler head connection. The Sprinkler contractor is responsible for sealing sprinkler penetrations.
10. Ceiling System shall be laterally restrained above all walls and at 24 foot intervals each way.  
4 way seismic bracing shall be required for max load every 106 sq/ft.
11. The grid shall be capable of supporting 48 pounds per square foot on a 4 foot by 4 foot 3/8 inch rod drop matrix, or 8psf with a 220lb concentrated point load anywhere on the grid. The grid will also have an optional continuous screw boss( CG-6200) on the CLEANROOM side with a plastic snap in cover. Screws shall withstand 750 pounds of pull out per screw, even after 10 engagements.

2.03 BLANK CEILING PANELS

- A. Unperforated pans, with welded corners, 16 gage, galvanized steel with powdercoated finish, various sizes up to 48 inches by 48 inches. Provide holes in panels for sprinklers and other utilities as shown on dwgs.
- B. Alum. Honeycomb panels 1/4" to 5" thick. Top skin can have optional .040" alum. tread plate non-slip walkable surface.
- C. 2" PIR core interlocking Pharma Panel with 26 ga steel facings. R-16 insulation rating. Cross t's can be expanded to every 12' with this option.

**Manufacturer:**

1. Channel Systems, Inc. 74 98<sup>TH</sup> Ave. Oakland, Calif. 94603 (510) 568-7170 Fax ( 510) 568- 4619  
Website: www.channelsystems.com

**Part 3 Execution**

**3.01 INSTALLATION**

- A. All installation methods shall be in accordance with the latest recommendations of the manufacturer and in conformance with this specification and reviewed shop drawings.
- B. Cleanroom grid shall be laid out in accordance with the approved shop drawings. Main runners shall be laid out so that ends are staggered throughout the room. Main runners shall be spaced a 48 inches o.c. maximum, and supported at 48 inches o.c. by grid hangers and hanger rods from the secondary horizontal system. Cross tees shall be spaced as required by ceiling layout.
- C. Install hanger rods and seismic bracing, if required, from the framing system above. Attach hanger rods at proper elevation and adjust leveling nuts. Set grid and perimeter elevation with laser level.
- D. Install ceiling grid after major above-ceiling work is complete. Coordinate the location of hangers and carrying channels with other work.
- E. Hang independently of walls, columns, ducts, pipe, and conduit.
- F. Install continuous perimeter anchored to wall at 48 inches, flush with grid. Splice perimeter with connecting bar.
- G. Unpack grid components and wipe surfaces prior to locating in cleanroom area.
- H. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest adjacent hangers and related carrying channels to span the required distance.
- I. Interior an exterior corners shall use perimeter connecting bars attached to the perimeter bars.
- J. Layout runners and cross-runners so that fixtures will not produce eccentric loads. Where fixture installation will produce rotation of runners, provide stabilizer bars.
- K. Install exposed members using maximum lengths. Align each joint using splice connectors. Butt interior end joints tight. Members shall be flush.
- L. Exercise care when cutting members onsite to ensure that surface finish is not defaced.
- M. Seal all joints with sealant.
- N. Caulk perimeter continuously at wall.
- O. Seal all grid penetrations with sealant to prevent air leakage.
- P. Apply foam tape continuously at each flange of the grid system, overlapping in corners if necessary.
- Q. Install panels with edges fully hidden from view by flanges of grid system and in full contact with foam tape. Tape seal shall not allow air to transfer through the ceiling.
- R. Anchor panels to grid using hold down clips.
- S. Seal all pipe penetrations through panels at sleeves with urethane or silicon dielectric gel above ceiling line.
- T. All cutouts required in the ceiling system for other trades shall be provided by the ceiling contractor.

**3.02 ADJUSTING**

- A. Ceiling system shall be level overall within 0.10 inch and shall be level within 0.062 inch in 10 feet.

B. Materials found to be defective or improperly installed shall be replaced.

### 3.03 CLEANING

A. Periodically during work and after completion of work, clean up and remove all debris from jobsite.

B. Remove all rubbish and cartons, and leave jobsite cleanroom clean.

C. See Specification Sections 01723: General Clean Zone Construction Procedures, and 01724: Construction Cleanroom Protocol.

### 3.05 PROTECTION AND REPAIR

A. Protect the work of others during execution of work and repair any damages caused. Do not allow construction dust and debris to contaminate installed units.

All products meet or exceed ISO 141644-1, cGMP and FDA requirements and are compliant for Pharmaceutical Manufacturing.

Thomas Boyden – Director of Global Marketing

Please contact us today or visit our website at [www.channelsystems.com](http://www.channelsystems.com) or [www.middleeastcleanrooms.com](http://www.middleeastcleanrooms.com)

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