GORDON

Flush Grid Systems

FG38

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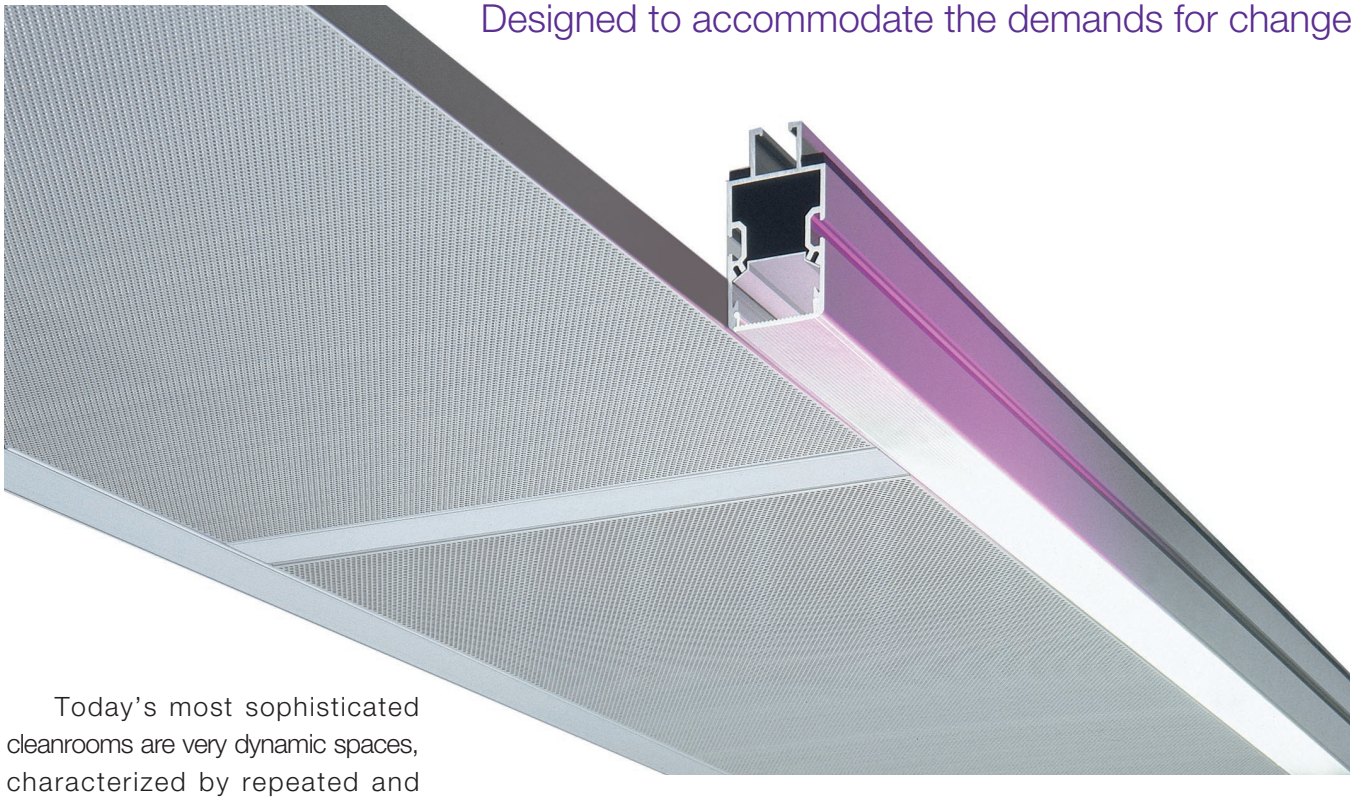
CLEANROOM PRODUCTS DIVISION

Why Flush Grid?

Designed to accommodate the demands for change.



Today's most sophisticated cleanrooms are very dynamic spaces, characterized by repeated and numerous changes. Introduction of new products, production techniques, process tools, or the integration of new systems can require dramatic modification of the cleanroom layout.

Gordon's ***FG-38 Flush Grid*** ceiling system was designed to accommodate the demands for change in today's semiconductor cleanroom. The flush roomside surface provides for location and anchoring of room partitions, mini-environment enclosures, and automated material transport systems wherever needed; and facilitates future cleanroom reconfiguration.

FG38 Load Table

Deflection Formula	L/360	L/360
Hanger Spacing (Span)	96"	96"
Main Tee Spacing	24"	48"
Maximum Point Load (LBS) @ Mid Span	1,216	2,416
Applied Load (LBS/SF)	175	150
Maximum Point Load (LBS) Hanger (pull out)	2,250	2,250

A FULLY INTEGRATED SYSTEM

Our ***FG-38*** fully integrated ceiling system incorporates all of the features required of a flush grid:

- U.L. approved, factory installed recessed lighting with flush finish snap-in lenses;
- Provisions for ionization wiring and equipment;
- FM approved fire sprinkler fixtures;
- Fluid seal gel channel to guarantee a leak-proof installation (an optional gasket seal version is also available);
- Flush finish air diffuser face screens;
- Accessory attachment fixtures for walls, transport equipment, etc.

STRUCTURALLY SOUND

In order to meet the performance demands of all of the built in design features *plus* the in-use ceiling system requirements, a flush grid must offer maximum strength. Gordon's FG-38 satisfies all of the challenges to perform with minimal deflection even under heavy load conditions due to installed equipment, accessories and personnel. The robust FG-38 extrusions and heavy duty fasteners provide maximum rigidity without the need of special reinforcement or additional suspension points.

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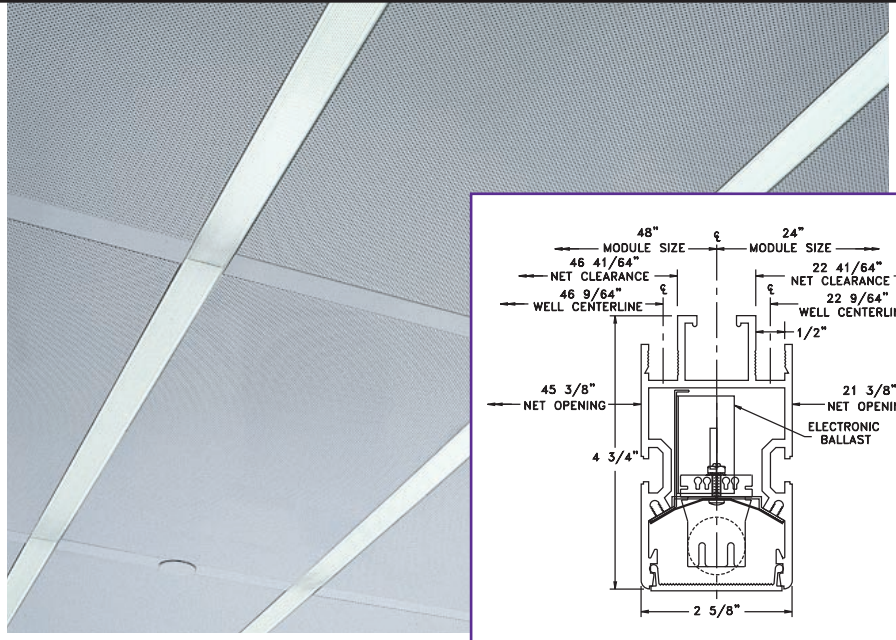
Lighting



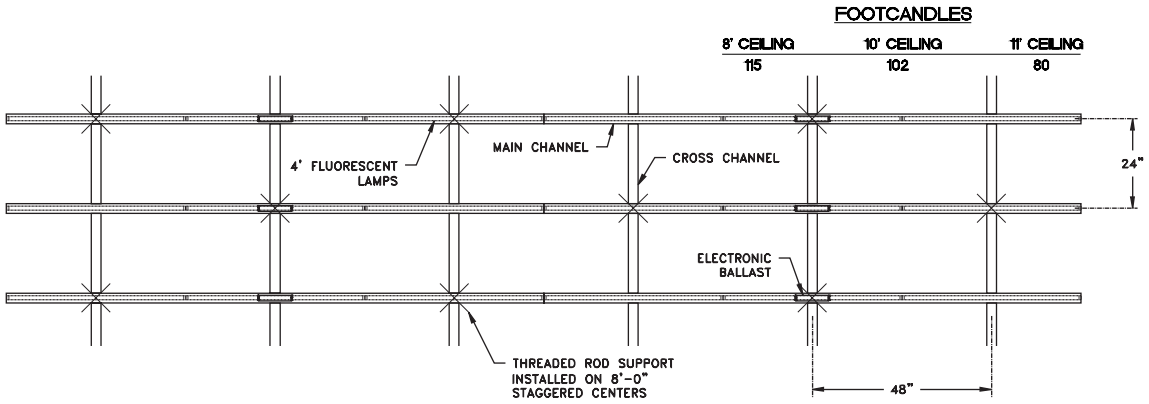
Filter Size: 22 1/8" x 46 1/8" (knife edge dimention)

Gordon's FG-38 delivers unsurpassed light output. Designed by lighting professionals, Gordon's FG-38 achieves the highest light levels attainable by a flush grid ceiling system. Typical flush grid light intensities can be met by the FG-38 with light tracks spaced only 4-feet on center. When higher light levels are desired, we are able to utilize the more commonplace 2-foot light track spacing to deliver higher light levels than any other provider.

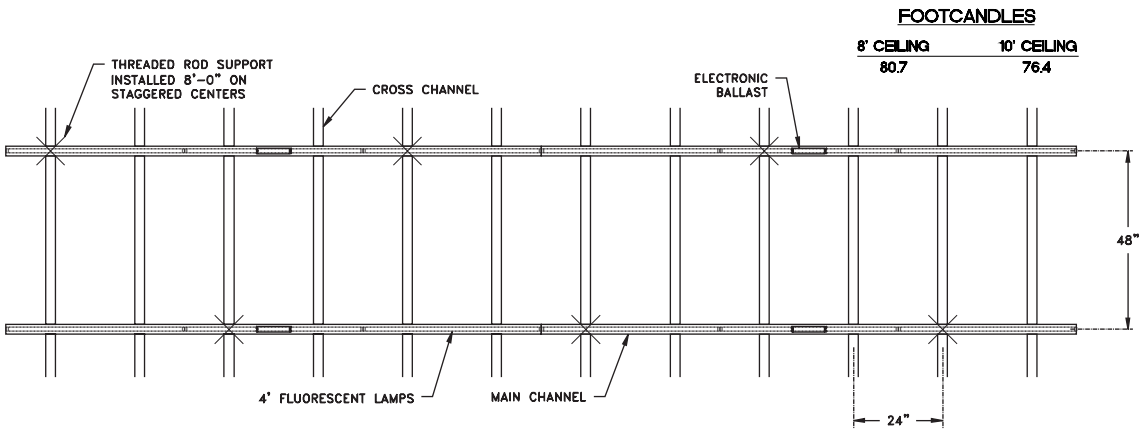
FG-38 recessed fluorescent fixtures are factory installed, wired and fully encapsulated within the main runners. Gordon's ***UL-listed*** light tracks feature quick-connect electrical fittings for rapid and clean system installation, electronic ballasts, and specular lamp reflectors. Clear or opaque acrylic prismatic lenses snap in for a flush roomside finish.

Wiring penetrations are factory fabricated and assembled utilizing seal-tight cable fittings to provide leak-proof supply power hook up.

FLUSH GRID LIGHTING LAYOUT OPTION "A"



FLUSH GRID LIGHTING LAYOUT OPTION "B"



All of the Performance Plus the Benefits o

The ***FG-38*** Flush Grid ceiling system introduced the innovative "stick-built" concept of flush grid design, significantly advancing the art of cleanroom construction. Gordon is the only provider of flush grid ceiling systems that were **conceived** and **engineered** exclusively for field assembly.

"Why stick-built?"

The ready appeal of this concept is that it addresses so many inherent design problems posed by the rigid constraints of pre-welded modular configurations. While incorporating all of a flush grid's typical design features, Gordon's FG-38 provides important benefits that contribute to the overall success of a cleanroom project.

FG-38 FLUSH GRID ADVANTAGES:

Guaranteed leak-free

Because it is field assembled into a single system, the FG-38 by Gordon provides a continuous and uninterrupted gel channel across the entire cleanroom. There are no joints between modules requiring special attention to achieve an acceptable seal.

Fastest possible certification

Since the gel sealant simply flows uninterrupted throughout the ceiling, it is impossible to have induction or by-pass air leaks, guaranteeing that the only potential for leaks is in the filters. The absence of any other leak path means that certification time is significantly reduced.

Perfectly square

Dimensional and squareness tolerances are perfectly maintained. FG-38 Flush Grid is fabricated without the heat of the welder's torch. There is no necessity for lengthy specification definition of acceptable tolerance limits to achieve desired fit and finish of the installation.

Completely caulk-free

The unique lateral compression assembly fasteners of the FG-38 allow for a liquid- and air-tight seal at every grid intersection. A die-cut cellular urethane gasket affixed to the end surface of the grid member gel channel compresses when the lateral fasters are tightened, creating a leak-free seal. No additional preparation is required prior to pouring the gel filter sealant.

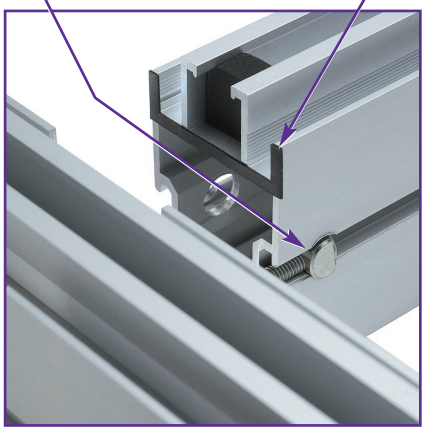
Less gel required

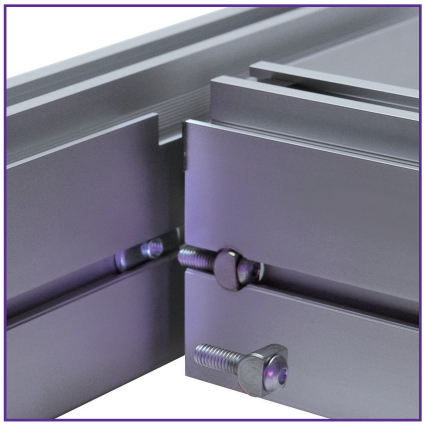
The gel-seal version of Gordon's FG-38 was designed to minimize the gel channel while still allowing for adequate insertion tolerance and easy installation. Reducing the amount of the costly gel material required to fill the gel channel by at least 25%, significant savings are realized in materials alone. And if 25% less gel is installed, pour time labor is reduced as well.

Installation adaptability

The stick-built design of the Gordon FG-38 provides unparalleled installation flexibility and adaptability. Firewalls, columns, and other immovable architectural features may not be at the exact planned location or to the tolerances designed. Stick-built systems easily adapt to accommodate the unexpected but commonplace occurrences that jeopardize construction schedules. Some minor on site rework of available parts rapidly adapts the FG-38, avoiding costly delays from welded module replacement or rework projects.

Gordon's die-cut cellular urethane gasket ensures a perfect seal when lateral fasters are tightened





Gordon's unique lateral compression assembly fasteners

Lowest Shipping and Material Handling Cost

Because your FG-38 ceiling system is field assembled, ship-

f Stick-Built Design

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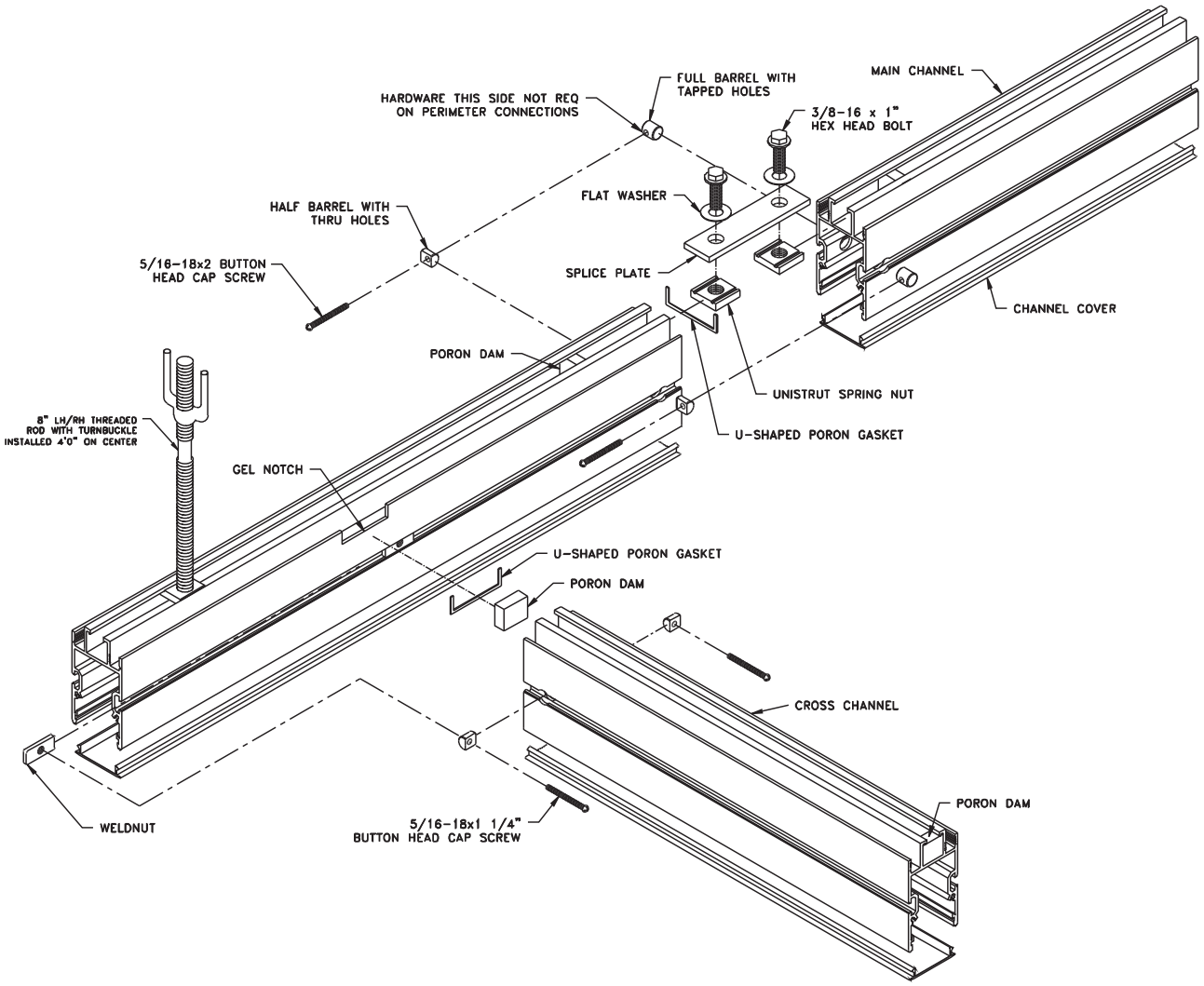
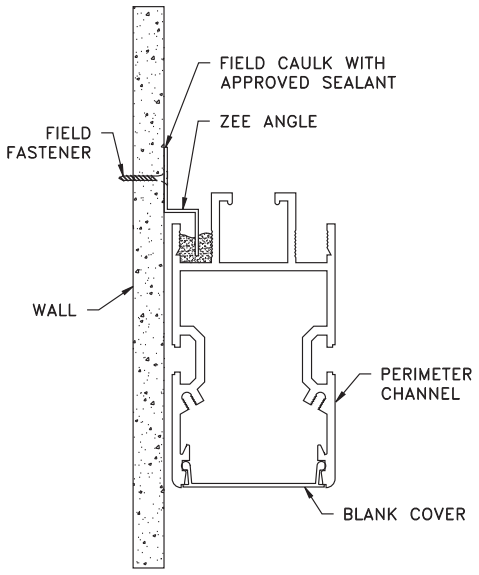
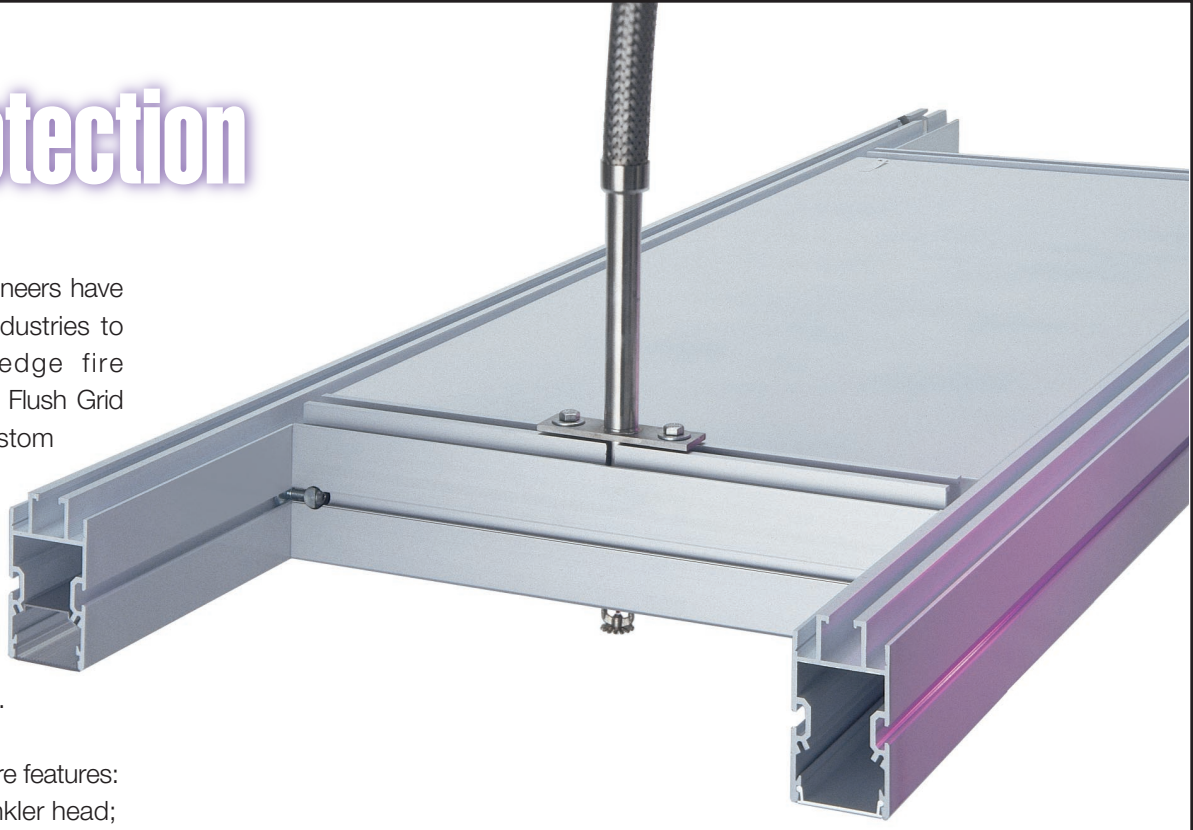


ments contain only product instead of mostly air, as in the case of large welded modules. Modular systems require nearly 4 times as many trucks to transport the same size project. Shipping crates are easier to unload and transport and do not require special material handling equipment or extra personnel. There is no simpler product to use for retrofit construction in existing buildings.

Ceiling perimeter detail



Fire Protection



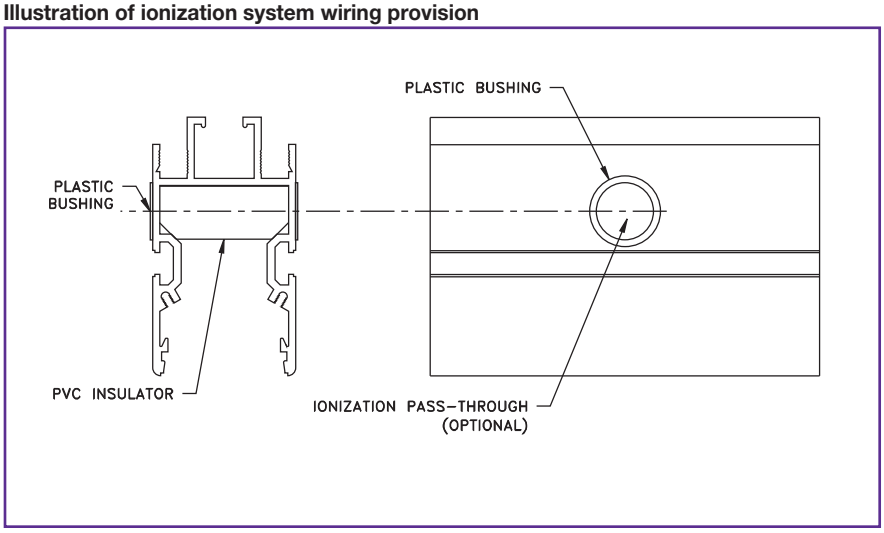
Gordon's design engineers have teamed with Flexhead Industries to incorporate leading edge fire protection into the FG-38 Flush Grid ceiling system. These custom designed sprinkler fixtures perform the dual functions of providing easy to install FM-approved fire protection and structural reinforcement at grid penetrations.

Each FG-38 sprinkler fixture features:

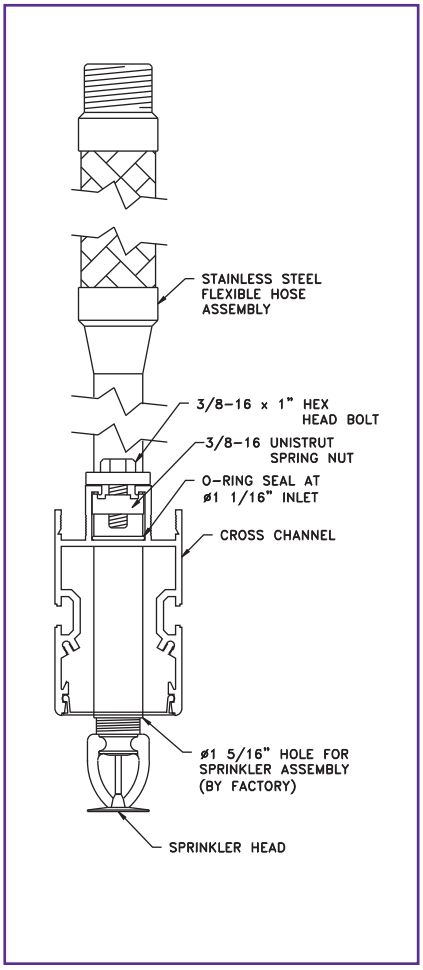
- a quick response sprinkler head;
- a specially designed,16-inch long, narrow gauge sprinkler drop to allow for minimal interference with filters or other ceiling insertions;
- a 6 feet long flexible stainless steel supply pipe for optimum ease of original installation and relocation;
- FM (Factory Mutual) approval.

Sprinkler fixtures mount to factory-fabricated sprinkler cross tees through machined penetrations. An aluminum trim plate provides a flush roomside finish.

Illustration of ionization system wiring provision



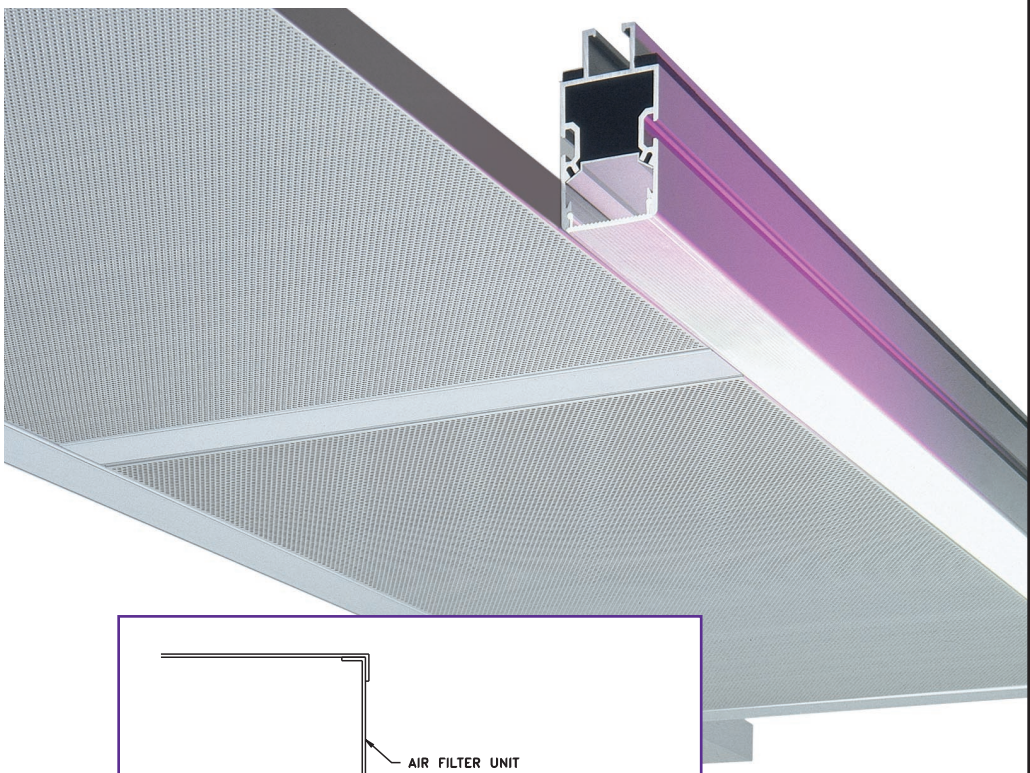
Section view of sprinkler penitration

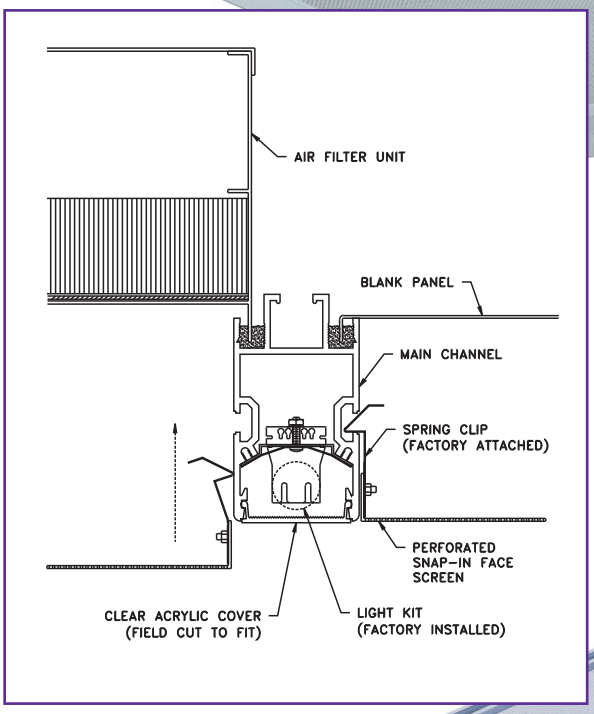


Face Screens

One of the chief determining factors of the performance of the cleanroom is airflow uniformity.A key element used to achieve airflow uniformity in a Gordon FG-38 cleanroom is our perforated air diffuser face screen. Gordon's Flush Grid face screens were developed utilizing a carefully engineered perforation pattern with hole size designed to contribute just enough backpressure to equalize leaving velocities throughout the ceiling.

Air diffuser face screens install quickly and easily. Four spring clips allow for rapid insertion and then hold the grilles securely in place. Removal is made easy by retracting the spring clip with a simple tool and drawing the screen down to release.

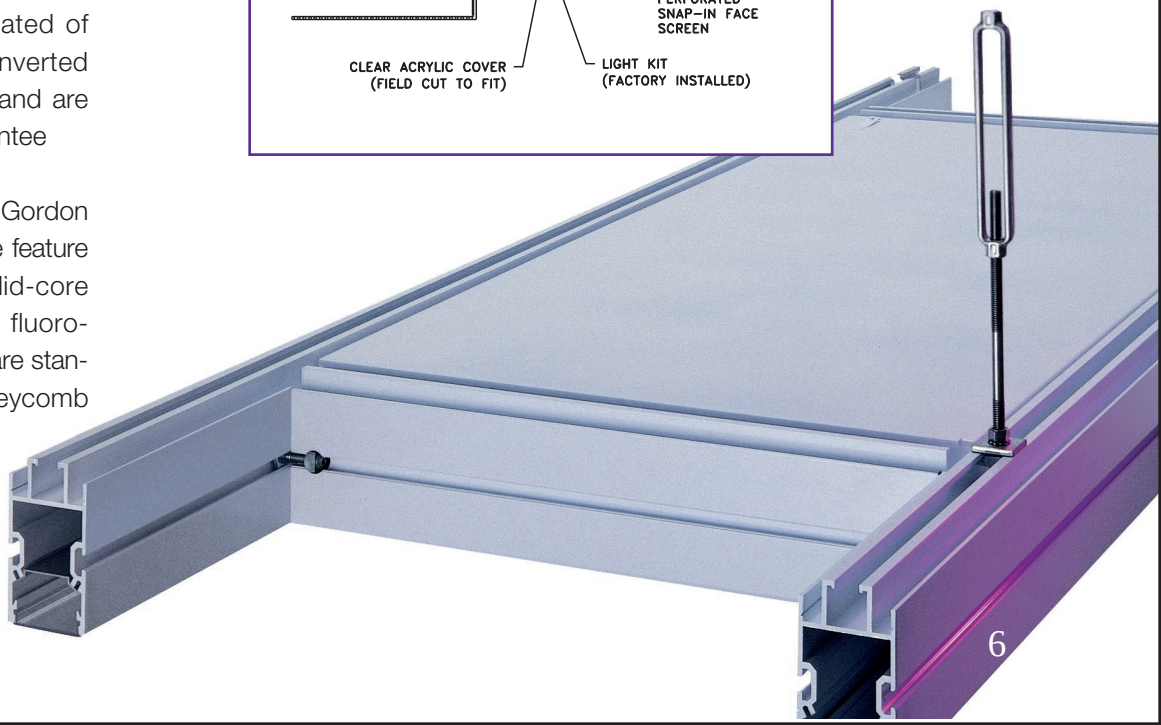




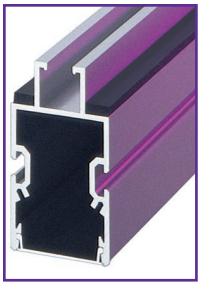
Blank Panels

Gordon offers blank-off panels for use with all types of grid systems. We offer knife edge pans designed for insertion into FG-38 gel seal flush grid. Fabricated of aluminum or steel, these inverted pans have welded corners and are painted and sealed to guarantee air tightness.

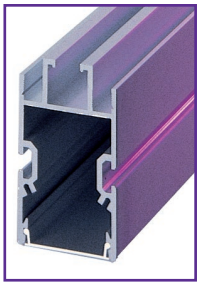
For gasket seal FG-38, Gordon offers panels of all types. We feature our exclusive Alpolic™ solid-core aluminum skin panels with fluorocarbon finish. Also available are standard duty or walkable honeycomb core panels with aluminum skins. Specialty panel designs to meet job specific requirements are gladly provided.



Optional Gasket Seal



Gasket-seal



Gel-seal

Today's semiconductor facilities are often designed to slightly lower cleanliness standards while using minienvironments, tool enclosures and FOUP technology to isolate and provide ultra clean critical process zones. Commonly employing fan-powered filter units to supply the ball-room filtration, cleanrooms of this design do not require the highly effective but more costly gel-seal ceiling systems. For these applications, Gordon offers the FG-38 Flush Grid ceiling system in a gasket seal version.

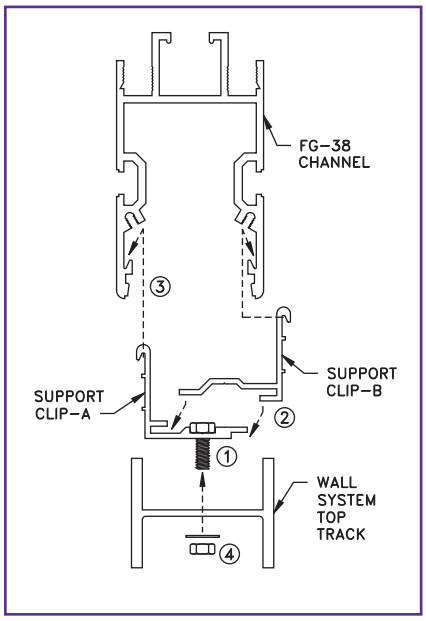
All of the design features expected of a flush grid ceiling remain unchanged. The gel channel has been eliminated to provide a flat shoulder for affixing a gasket tape.

As with all Gordon gasket grids, gasket materials are available to meet any customer-specified performance standards.

Accessory Items

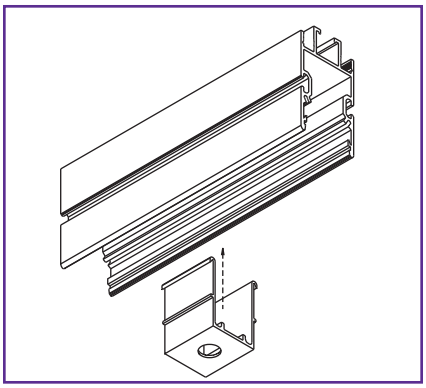
Because it is necessary for systems to have interface...

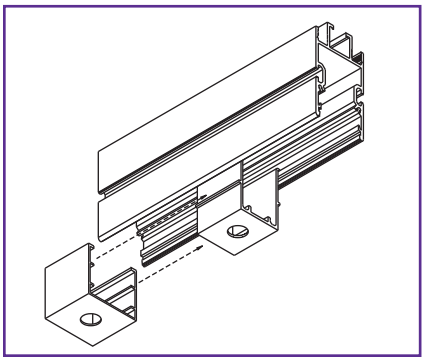
Gordon provides connecting hardware for many types of accessory attachment.

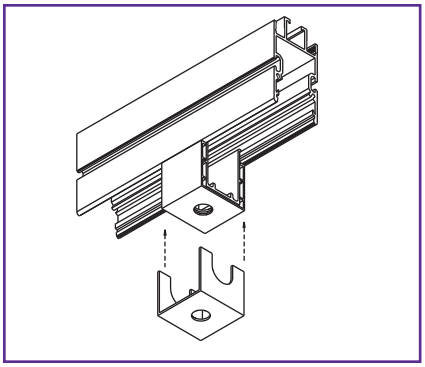


◄ For ***wall systems*** connection Gordon offers several methods of fastening partitions to FG-38 ceilings. All attachment hardware allows for simple connection and relocation without damage to ceiling components.

Automated Material Handling System (AMHS) and minienvironment enclosures require extremely strong and secure attachment devices. Gordon has connectors to meet the most demanding performance specifications. Relocation is fast and easy and does not harm system components. ►







Gordon also manufactures compatible wall systems and the ultra-quiet PHANTOM line of fan-powered filter modules. Ask your Gordon Cleanroom Products representative for details.

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