About Clean Rooms

What You Need To Know

What's a Clean Room?

DEFINITION

A clean room is a controlled environment where pollutants like dust, airborne microbes, and aerosol particles are filtered out to provide the cleanest area possible. The cleanliness of the space is defined by ISO Standard 14644-1. This standard (ISO 14644-1) is a document defining the number and size of the particles in a clean room environment. The specification looks at a clean room as a total system. It does not classify the individual components that make up the clean room.

Clean rooms have a cleanliness level quantified by the number of particles per cubic meter at a predetermined molecule measure. ISO clean room requirements are classified according to how much particulate of a specific size exist per cubic meter. The "extremely clean" clean room is a Class 1 – the least "clean" a Class 9.

WHAT ARE TYPICAL CLEAN ROOM APPLICATIONS?

Clean rooms are often found in facilities created for the manufacture of microelectronics, optics, pharmaceuticals, and other industries where activities requiring special attention can be as diverse as growing a crystal in a lab to replacing a hip in an orthopedic operating room. In all cases, the number and size of the particles in the atmosphere must be controlled.

In today's technologically demanding environment, a little bit of dirt can cause a great deal of trouble. For instance, a speck of dust so small it can only be seen under a powerful microscope, could throw a spacecraft's guidance system off sufficiently enough to cause the spacecraft to miss the moon by many miles. Because these microscopic amounts of foreign matter can create such problems, aerospace industries must meet superior standards of cleanliness. These standards can't be maintained if sensitive electronic components are manufactured in conventional production areas.

Airborne particles, because of their small sizes, are measured in microns (0.00003937 in.). A micron is very small... putting this in perspective, there are 25,445 microns in one inch. Clean rooms are typically concerned with particles of 0.5 microns (0.000019685 in.) to 100 microns (0.003937008 in.).

The cleanliness level is controlled by laminar flow, constantly flowing the air along a parallel path, usually from the ceiling to the floor. The air is cleaned by passing it through High Efficiency Particulate Air (HEPA) filters. In order to maintain the desired level of cleanliness, the room must be free of materials that will release particles. A positive pressure is always maintained in the higher class clean room; e.g., a Class 5 clean room will be maintained at a higher pressure than the Class 6 anteroom, which will be at a higher pressure than the outside hallway.

Armstrong®
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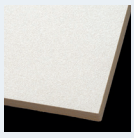
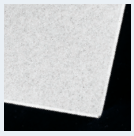
Armstrong® Clean Room™ Ceiling Systems



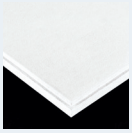
Optima Health Zone

- Highest level of sound absorption, NRC 0.95 open plan spaces
- Long-lasting water-repellency for cleaning and disinfection
- Smooth, fine textured visual
- Tegular profile
- Not suitable for use in pressurized environments



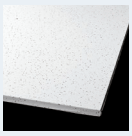
Ultima Health Zone

- Excellent combination of sound absorption and sound blocking for closed plan spaces, NRC up to 0.80, CAC 35
- Long-lasting water-repellency for cleaning and disinfection.
- Smooth, fine textured visual
- Tegular profile



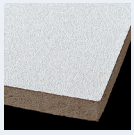
Calla Health Zone

- Excellent combination of sound absorption and sound blocking for closed spaces (NRC 0.80, CAC 38)
- Exceptional durability & cleanability with a smooth, durable finish – impact-, scratch-, and soil-resistant
- Smoothest mineral fiber ceiling available



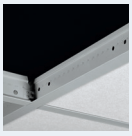
Clean Room FL

- Good combination of sound absorption and sound blocking for closed plan spaces, NRC 0.55, CAC 35
- Border panels available to ensure Class 5 and acoustic performance in rooms that require border cuts or other ceiling penetrations
- Soil-resistant polyester film



Clean Room VL

- Good sound blocking (CAC 35) and Fire Guard™performance
- Vinyl-covered surface for excellent durability



15/16" Clean Room Grid – Aluminum or Steel

- Aluminum construction for maximum corrosion resistance and non-magnetic environments
- Steel construction – Heavy-duty main beam classification for use in seismic categories D, E, and F

1-1/2" Clean Room Grid – Aluminum

- Aluminum construction for maximum corrosion resistance and non-magnetic environments
- Wider flange supports installation of HEPA filters

QUESTIONS ABOUT CLEAN ROOMS?
Our TechLine experts can answer any questions you might have about ceiling system installation in clean rooms.

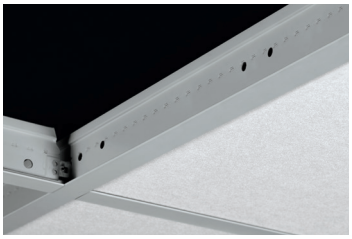
TechLine 877 276 7876
armstrongceilings.com/cleanroom)

CS-4277-1124

CEILINGS

Based upon independent laboratory testing, Clean Room™ VL, Clean Room FL™, Calla® Health Zone™, Ultima® Health Zone™ (Items 1935 and 1937), and Optima® Health Zone™ panels (Items 3114, 3115, 3214, and 3215) can be used with our Clean Room Grid system with or without hold-down clips. Hold-down clips may be required to maintain positive pressure. Border Hold Down Clips (BHDC) can be used around the perimeter and Clear Hold Down Clips (CHDC) can be used in the field. If accessibility is important, do not install hold-down clips. These systems are suitable for use in Class 5 clean rooms as defined by ISO 14644-1.

SUSPENSION SYSTEMS



Typically, clean room grid is either 1-1/2" or 15/16" wide. The purpose of the wider grid is to accommodate the HEPA filters that are usually manufactured with a 3/4" flange and a 3/4" gasket. Armstrong® Clean Room suspension systems offer both a 1-1/2" face and a 15/16" face. Steel is great for use in IBC Seismic Design categories D, E, F (Heavy-duty system). Aluminum non-magnetic can be used in MRI rooms.

INSTALLATION

Clean Room FL offers border and field panels. If acoustical absorption is required, specify a combination of field and border units – field units for use as full-size panels only; border units for use when panels must be cut (borders, sprinkler head penetrations, etc.). For Ultima Health Zone and Optima Health Zone panels, use lay-in panels for cut border panels or install full-size panels with a drywall perimeter.

Because our Clean Room VL products are not edge sealed, it is important to install them carefully. Particle contamination, due to careless handling, could result in difficulty in the clean room start-up. After the ceiling has been installed, the seal provided by the gasketing should prevent any possible contamination from the edges from entering the clean room. The backs of Clean Room VL, Clean Room FL, and Optima Health Zone panels are sealed with a back coating that is applied during manufacturing.

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