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3 Systems for Cleanroom Walls

Excerpt from the [GMP Compliance Adviser, Chapter 3.E Cleanroom construction components](#)

by Harald Flechl

Over the past several years, wall and ceiling systems have become the established state of the art in finishing technology. The numerous manufacturers of such systems also offer solutions that are suitable for fire zones and large, high rooms – such as warehouse storage rooms. Wall and ceiling systems are flexible when it comes to planning and installation; subsequent modifications can be made quickly and easily.

The most common application is a "room-within-a-room" solution. This means that a conventional building made of concrete or brick with columns and support structures serves as a shell, and the clean rooms are fitted with system walls and ceilings inside it. To be able to benefit from the advantages of a walkable ceiling with fixtures, appropriate heights must be planned for the structure. A further advantage is the short assembly time at the construction site and the possibility of plan changes until shortly before assembly. As they are state of the art, there is little need for discussion with the authorities.

Wall systems made from metal panels are typically constructed according to one of three design principles:

- mono-block
- band grid
- axis grid

The last-mentioned type is the most commonly used. Typically, the choice is made based on the desired design finish to achieve a sealed cleanroom surface.

Glass walls made of single-pane safety glass (SPSG) were still a ground-breaking achievement in the nineties, but today such fully transparent systems are offered by several manufacturers. During operation, it is often the case that special collision protection is not always necessary, as the employees are more "cautious" with glass. Due to their full transparency, SPSG wall systems often allow simpler visual communication and natural lighting into rooms with lower ceilings.

When cleaning, make sure that no streaks remain. Although streaks are not a sign of poor cleaning, people tend to equate optical clarity with the effectiveness of cleaning.

In Figure 3.E-14 you will find an overview of the most important information for each of the three systems.

Variant	Design details
Mono-block	<ul style="list-style-type: none"> ▪ Compact element made of two coated steel or stainless steel panels completely filled with inserts made of the following materials: <ul style="list-style-type: none"> ○ Polyurethane (PU) foam, ○ Expanded polystyrene (EPS, styropore) ○ Epoxide resin ○ Mineral wool ○ Gypsum board ○ Aluminium comb ○ or combinations thereof ▪ Elements connected with dovetail joint system (integrated in the panel or with connector profiles) ▪ Defined silicon beads at the element butt joints ▪ Installation elements prefabricated according to plan (see Figure 3.E-18) ▪ Door elements most often include an integrated frame with the door ▪ Wall cladding sometimes available using thinner panels
Band grid	<ul style="list-style-type: none"> ▪ Band profiles between the wall elements (twice the number of seams) ▪ Band profiles can be opened to one side without influencing the status of the room on the other side ▪ Access to dead space possible from one side for subsequent utility installations ▪ System appropriate for wall cladding
Axis grid	<ul style="list-style-type: none"> ▪ Lower number of seams ▪ One-sided disassembly of the cladding not possible ▪ System appropriate for wall cladding
Glass walls	<ul style="list-style-type: none"> ▪ Safety glass panels built according to plan ▪ Panels are typically framed ▪ Cutaways and pass throughs only possible if pre-fabricated – later adjustments very difficult
For all alternatives	<ul style="list-style-type: none"> ▪ Most often prefabricated according to drawings ▪ Floor profiles are installed directly at the floor (see Figure 3.E-15) ▪ Baseboards for slope compensation ▪ Recessed floor installation to enable seamless finish (see Figure 3.E-16) ▪ Ceiling connection with height compensation (see Figure 3.E-17) ▪ Cutouts for installations prefabricated, but also possible during installation using frames

Figure 3.E-14 Comparison of wall system variants

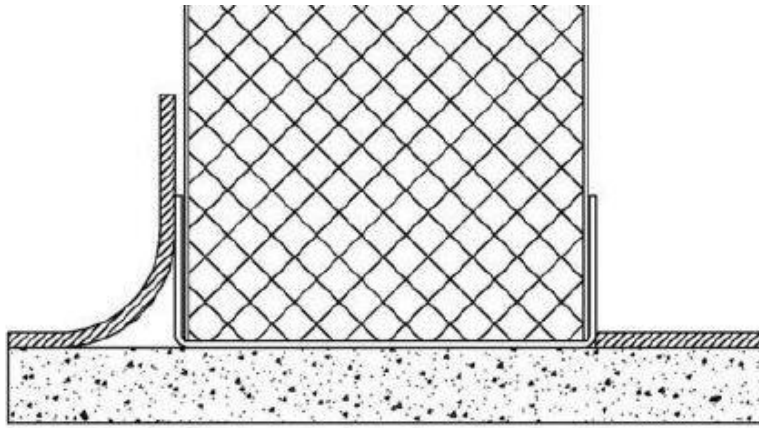


Figure 3.E-15 Wall element with simple floor rail installation

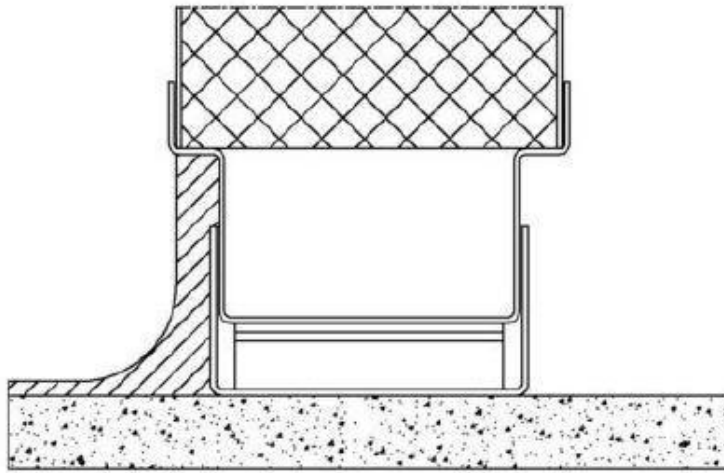


Figure 3.E-16 Wall element with recessed baseboard

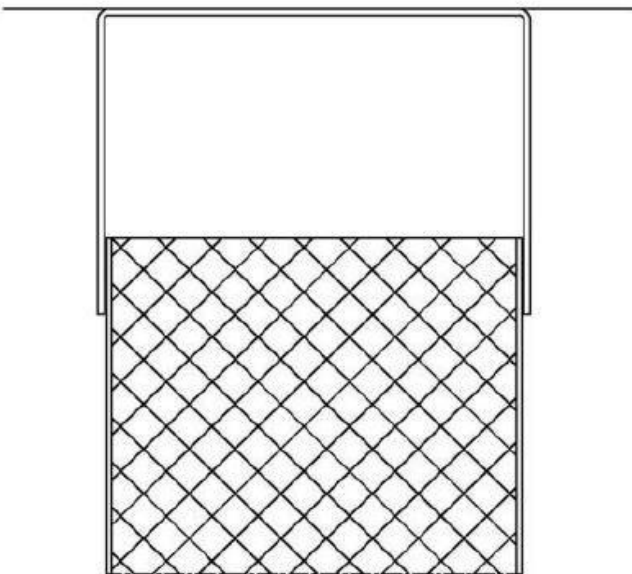


Figure 3.E-17 Wall element with ceiling installation profile

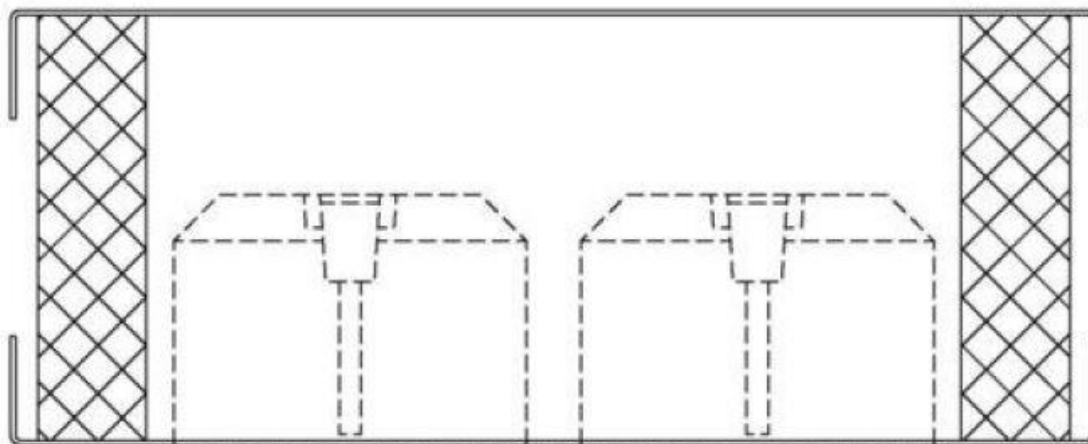


Figure 3.E-18 Cross section of installation components including pre-installed electrical outlets

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