



CEILING SYSTEMS

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Manufacturer's Recommendations 2007

Many specifications call for the ceiling to be installed in accordance with the "manufacturer's recommendations" and this approach is now adopted in BS EN 13964(2004) "Suspended ceilings – Requirements and test methods" which, within Annex A, refers to "Supplier's instructions". The following comments are given as a guide to such requirements which should be consulted prior to installation. Where a specific point is not mentioned or for further information on those that are, please contact Internal Technical Sales on 0800 371849 for UK and 1800 409002 for ROI.

NB BS 8290: Part 3 (1991) has now been withdrawn and superseded by BS EN 13964 but the advice it contained may still be found useful.

- 1) Armstrong recommends that the ceiling should be set out so that the layout is as symmetrical as possible and that perimeter tiles are in excess of $\frac{1}{2}$ a module. In the event of irregular shaped rooms or a dimensional conflict the specifier shall indicate their preference prior to installation.
- 2) Some Armstrong tiles exhibit directionality in their face texture or pattern. It is recommended practice that square module tiles, with directional fissured face patterns, are installed with the direction of the pattern alternating from tile to tile, creating a 'chequerboard' effect. For other directional products, the specifier should indicate if the pattern is to be linear, alternate (chequerboard) or random in layout, or to follow a specific design.
- 3) Exposed grid systems should be installed in the 'ladder' formation with main runners at 1200mm centres (1200mm or 600mm modules) and 1200mm cross tees spanning between main runners at 600mm centres. 600mm cross tees then span between the 1200mm cross tees and run parallel to main runners. The 'H' formation grid layout (1200mm cross tees at 1200mm centres and 600mm cross tees perpendicular to main runners) should not be used, as this will result in a greater grid deflection from a given tile load, unless intentionally specified and the consequences understood. All Armstrong loading information is based upon grid installed in the 'ladder' formation.
- 4) The minimum Cavity depth necessary to install a modular suspended ceiling will normally be determined by considerations such as any service fittings, ducts and pipes which are present or which will have to be accommodated. For exposed grid lay-in tile, which have to be lifted diagonally upwards through the grid before being laid down onto the grid flanges, a minimum clear height of about 150mm is required. For Vector edged tiles which are only engaged from below the grid, or where there are no cavity services present, then practical considerations of handling and fixing short hangers will prevail.
- 5) Suspended ceiling grid systems are primarily intended to support the distributed load from the ceiling tiles, which is typically between 1.2kg/m^2 and 8.5kg/m^2 . This will ensure a deflection of the grid, between points of support, which is visually acceptable.
- 6) The maximum distributed load that Armstrong grid systems can support can be found in the Trulok Suspension Systems brochure and is calculated based on the Class 1 (table 6) deflection criteria of BS EN 13964 (span/500, but not greater than 4mm).
- 7) In certain instances it may be possible to extend the centres of the hangers supporting the main runners. This will be dependent upon the layout of the grid, the weight of the ceiling tile and whether additional loads are being supported by the grid. See the Trulok Suspension Systems brochure.
- 8) The maximum weight of flange or bulb supported service fittings, or the maximum point loads that can be supported by the ceiling grid will depend upon the type and layout of the grid, and the weight of the ceiling tile. Calculations for specific circumstances can be obtained from Internal Technical Sales.
- 9) Dynamic fittings, such as air diffusers or grilles, should be independently supported to ensure that vibration is not transferred to the suspended ceiling system.
- 10) Other than very light weight halogen fittings, spotlights, luminaires and other service fittings should not be supported directly onto the back of ceiling tiles, otherwise damage or excessive deflection could occur. A pattress or other suitable method must be used to ensure that the load is transferred back to the grid system. The overall load of the tile, fitting and pattress must not exceed the maximum load for the grid system. Alternatively direct independent suspension should be employed.

- 11) Where perimeter trims are to be fixed to surfaces or substrates which may be liable to shrinkage, such as timber or wood based battens, allowance should be made to prevent deformation or distortion of the trim occurring.
- 12) Perimeter trims should be neatly jointed at all external and internal angles. Overlapped sections or 'dummy' mitres (the overlapped lower section only mitred) are considered acceptable methods. Butt mitred joints should be specified prior to installation if required.
- 13) Suspension wire must always be mechanically pre-straightened prior to use and should not be less than 2mm diameter. Wire hangers should be straight and free from kinks.
- 14) The maximum length of any wire hanger is governed only by the ability to pre-straighten it.
- 15) When 'tying off' wire hangers, there should be at least 3 complete turns of the wire forming a tight coil.
- 16) Suspension hangers should be vertical or nearly vertical wherever possible. However, a hanger can be used at up to 45° from the vertical provided that there is a second adjacent hanger up to 45° from the vertical that opposes the lateral force of the first hanger. Any rigid braces used to provide lateral restraint should be less than 45° from the horizontal.
- 17) Main runners should have a hanger within 150mm of joints between abutting main sections.
- 18) Any grid section (main runner or cross tee) that bears onto the perimeter trim requires support within 600mm, so that excessive loads are not transferred onto the trim. This dimension should be reduced to 450mm or less if heavy overlay materials are used or service fittings supported by the tile and grid system are located near the perimeter.
- 19) A corrosion resistant grid system should be specified where atmospheric conditions regularly exceed 95% relative humidity, or if the environment is such that occupants have to take special precautions (i.e. protective clothing or masks etc). Corrosive liquids and cleaning materials should not be exposed or applied directly to any grid system. A corrosion resistant grid would also be appropriate when it is intended to subject the installed suspended ceiling to a high pressure cleaning regime.
- 20) Ceramaguard is hygroscopic, and as such may absorb moisture from the atmosphere (but without detriment to the mechanical stability of the tile) in a high humidity environment. The possible increased weight of the tiles should be considered in relation to the layout of the grid and the possible need for closer main runners and/or additional hangers.
- 21) At perimeters, two alternative details may be considered for cut mineral fibre Tegular and MicroLook tiles. If the face of the grid and the perimeter trim are at the same level, the tiles should be site reformed to the basic rebated detail using appropriate sharp craft tools. However, if the face of the tile and the perimeter trim are at the same level (i.e. the grid face is higher), then the tiles do not need to be reformed, but the ends of the tees must be supported. This can be achieved by the use of the appropriate 'shadowline' perimeter trim. Alternatively if a 'flat' trim is used the end of the cut tees can be supported by the use of Armstrong border clips or Armstrong perimeter fill-in blocks which are also designed to fill the gap between the perimeter trim and the grid that is left between the tiles. See the Trulok Suspension Systems brochure for details.
- 22) Reformed cut edges of Tegular and MicroLook mineral and soft fibre tiles should be hand decorated where the cut edge is clearly visible. This is generally not necessary at perimeters, where the cut tile edge cannot easily be seen, unless specified prior to installation.
- 23) For metal tiles, cut perimeter tiles must be secured to ensure the face of the metal tiles sits evenly upon the perimeter trim. This is normally achieved by the use of a perimeter channel with border wedges or extruded aluminium trims with cut tile spring wedges. Cut tiles with Premium B15 acoustic infill do not normally require securing, providing they are correctly and carefully cut with an appropriate high speed jig or bandsaw.
- 24) Unless specifically accepted by the specifier, pop rivets and screw heads should not be visible.
- 25) Except for ceilings required to provide structural fire protection or fire resistance, hold-down or retaining clips are not normally required unless specified prior to installation.
- 26) Armstrong will be pleased to provide a list of specialist ceiling contractors that have achieved OMEGA status.