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Guidance on the limiting maximum heights drywall partitions and linings

Parts 1 & 2 of BS 5234 Partitions (including matching linings) are generally the referenced standards which are used across the UK and Ireland to define the robustness criteria of drylining systems. However, within BS5234-1 1992 Partitions (including matching linings) – Part 1: Code of practice for design and installation it is stated that "manufacturers should state the maximum height limit of their partition systems".

Unlike other performance types (e.g. fire resistance, airborne sound insulation, etc), there is no obvious standard which outlines a common method for determining heights of partitions or linings. In the absence of any such standard guidance, the respective members of the GPDA: British Gypsum, Knauf, Siniat & Gyproc Ireland, agreed many years ago to adopt an internationally accepted methodology and take a uniform approach to the industry's calculation of maximum heights.

Unless other testing standards affect the maximum quotable height of a partition system (see other design considerations below), maximum 'cold state' heights referenced by GPDA members are based on maximum mid-height deflection of:

L/240 @ 200 Pa (where L = spanning height of the system)

The limiting level of mid-height lateral deflection of L/240 is considered as the serviceability limit state and is suitable for most painted or plastered finishes.

The uniformly applied pressure of 200 Pascals (0.2 kN/m2), is considered as a reasonable maximum, with sufficient safety margin, for typical internal applications.

Other design considerations that can affect maximum heights

- *Brittle finishes*
  For tiled finishes studs at 400mm centres also advised by BS8212: 1995 Table 3.

- *Fire resistance - cold state vs fire state*
  The applicability of cold state heights to fire state heights can vary depending on the fire resistance test standard.

  The BS 476 series of standards does not consider any height limit in respect to fire resistance.

  The EN fire resistance test standards limit fire state heights to furnace height unless certain criteria are met.

- *Different levels of Uniform Distributed Load [UDL] and maximum acceptable deflection*
  The design team may alter pressure of deflection criteria where it is known that alternatives are acceptable, e.g. air pressure is known to be lower or higher, or where increased deflection will not affect occupants or system stability.

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- *Line loads / Crowd pressures*
  Design teams may in some cases need to consider the effect of specific linear applied loads or crowd pressures. When defined forces are assessed to be applied to specific heights of a partition or lining system the level of maximum deflection may exceed that of the L/240 @ 200Pa criterion. To maintain the limiting criterion in this more onerous condition, the maximum partition height may need to be reduced or the stiffness increased to maintain the limiting deflection below L/240, such as reduced stud centres. Consideration should be given to where a partition is preventing a fall from height, guidance is provided in BS 6180 "Barriers in and about buildings – Code of Practice" and EN 1991-1-1 '' Actions on structures and general actions – densities, self-weight, imposed loads for building'' and test methods are available in BS 5234-2.

- *Serviceability Limit State [SLS] vs Ultimate Limit State [ULS]*
  The L/240 @ 200 Pa criteria is based on the considered 'SLS' of plasterboard lined partitions and wall lining systems. SLS considers the resistance to cracking of typical jointing and plaster finishing materials. It also considers the aesthetic aspects of a system. From a safety aspect, the maximum level of deflection before the metal framing starts to exhibit permanent deformation (ULS) will typically be much greater.

- *Impact loads*
  The use of L/240 @ 200Pa does not consider point loads such as heavy impact into the partition; resistance to such loads is set out within the test methodology of BS 5234-2.

There is a responsibility on the project design teams to consider all of the performances that need to be considered as they could have an effect on the respective systems maximum height when selecting an appropriate 'in use' specification of partition or wall lining. Where further design guidance is required contact the system producer.

GPDA

The role of the Gypsum Products Development Association (GPDA) is to develop and encourage the understanding of gypsum based building materials and systems. The Association provides a cohesive package of advice and information on all developments affecting the gypsum industry, and communicates it to all aspects of the construction industry. Issues include the latest technical and product developments as well as training opportunities in the industry.

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