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# The Guide to

# Dry Lining

## WALLS & CEILINGS

Understanding of house structural elements like walls and ceilings is important to make an informative decision which option is the most suitable when undertaking an repair or alternation work. Briefly ceilings can have either a timber or concrete structure. Walls can be loadbearing or non-loadbearing, either cavity or single-skin. There is a variety of ways that ceilings and walls may be constructed. In this section we will describe various installation techniques of the metal frame system and timber frame system for both walls and ceilings.



**A stud wall is the most common way to divide rooms. Its framework as with ceilings can be constructed either with timber or metal system.**

#### **Timber stud wall system**

Firstly it is required to choose the appropriate plasterboard for the walls (as per specification)- standard, fire, acoustic, water moisture. The thickness of plasterboards affects how far apart the stud walls should be positioned. General rule is that studs should be installed no more than 400mm apart from a board that is 9.5mm thick or 600mm if it is 12.5mm thick or 15mm. Taking into account the final finish, use taper-edged plasterboards for dry line finish only or square-edged plasterboards for plaster. How much plasterboard to buy? Calculate the wall's area and multiply its height by its width. Divide this by the area of one sheet. Buy a little extra to cover for cuts.

#### **Plasterboard types:**

To meet various performance requirements there is a selection of plasterboards available. There are solutions for enhanced moisture, fire,

acoustic, impact or thermal performance. The most common are ordinary plasterboards 9.5mm or 12.5mm or fire resistant plasterboards 12.5mm or 15mm. For special requirements like sound-proofing there are 15mm or 19mm sound block plasterboards available. Plasterboard generally comes in 1200mm wide sheets, designed to suit the standard 600mm stud spacing. Other widths- 900mm or 600mm are available for specific systems or where space is limited.

We can distinguish between square edge plasterboard and tapered edge plasterboard. Tapered edge boards are ideal for either jointing or skimming, while square edge is generally used for textured finishes.

**Standard plasterboard** - most common, comes in ivory/brown colours, suitable for applications with standard sound levels, structural properties or fire specifications. Can be installed in double layer.



Standard



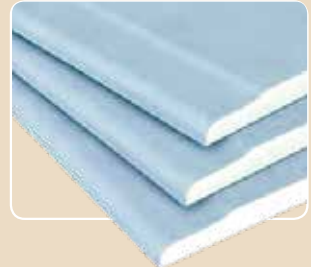
Waterproof



Fireproof



Soundroof



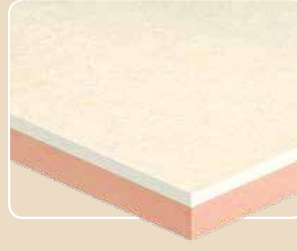
Vapourshield™



Thermal Laminate



Kooltherm Insulated



Cement board



**Vapour shield plasterboard** - usually comes with thin layer of metallic film on the reverse of the sheet. Used for thermal insulation and moisture resistance purposes.

**Acoustic plasterboard** - usually comes in blue colour, with higher density core to provide the sound blocking features. To be used with resilient bars in soundproofing metal frame system which prevents the passage of sound vibrations.

**Fireproof plasterboard** - usually comes in pink colour, consist of glass fibre and other additives that protect against fire.

**Waterproof plasterboard** - usually comes in green colour, consist of water repellent additives so can be used in humidity areas- kitchen, bathrooms, wet areas.

**Impact plasterboard** - very dense core to resist the impact.

**Insulation board** - (Thermal Laminate, Kooltherm Insulated), expanded polystyrene core, two component insulation board used for thermal purposes.

**Cement board** - ideal for wet area walls as provides strong bond with adhesives to ceramic or stone tiles and has the water-resistant formula.

In next step choose proper timber. Standard lengths of softwood measure 100x 50mm or 75x50mm. How much wood to buy? Calculate total length by adding the measurement of the length of each stud, plate and nogging. Buy extra as timber lengths will not divide exactly as required.

Before installation of frame work locate existing pipes and circuits to allow for water connections and electricity. Fixing stud wall must be carefully positioned. Generally it is easier to fix it

to the masonry then to another timber wall. Ideally a new wall should be fixed to studs in the existing one. In case when it is installed between the studs of existing wall position fixings at the top and bottom, into the ceiling and sole plates and into a central nogging. While fixing the wall to the floor and ceiling remember that the ceiling plate must be attached to the solid structure, ideally directly to the joist. In case where it is not possible fit noggins every 600mm between two joists and install ceiling plate to this. Use same method for the floor.

Ensure that the corners form the exact right angle. The corner is two walls butt-joined. On one wall an extra stud is added close to the corner and that is the fixing point for the plasterboard.

1. Mark the frame where you would like to position the wall
2. Install the floor plate - position it along the guide line and fix it to the floor.

3. Install the wall and ceiling plates- position them along the guide lines and fix to the wall or ceiling with screws.
4. Keeping the stud secure it to the ceiling and floor plates with 100mm nails inserted diagonally
5. Create the door frame by adding the noggin to the width of the doorway and installing it to the door studs. Cut the stud to fit it between the top of the doorway and the ceiling plate- secure it at the centre of the doorway width.

### Metal stud wall system

Measure and mark the guide lines on the floor, walls and ceiling where to install the wall channels (profile C) and ceilings and floor tracks (profiles U). Mark the opening for doorway and where to install the vertical channels (profile C).







Use the snips to cut the profiles where required. Screw the floor tracks with TEX screws no more than 600mm apart. It is recommended to use an acoustic tape for insulation. Fix the wall channels and secure them with screws placed no more than 600mm apart. Fit the ceiling tracks again with screws 600mm apart. To create the doorway insert the timber into the floor track for extra support and position the channel for the door head with drywall KSGM or KSGD screws. Insert the vertical channels into the tracks- you can properly fix them with TEX screws. Fix noggins if you require extra support. Attach plasterboards to both sides of the wall.

### Applying plasterboard

Dry-lining a wall means attaching plasterboard to a wall, which results with a smooth surface ready to decorate. It's quicker and

easier to get a perfect finish this way than with wet plaster.

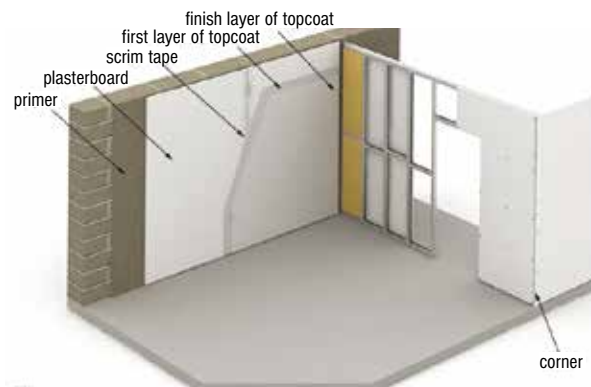
Dry-lining is straight forward. First of all draw the guide lines on the wall to properly install plasterboards. Allow an extra 10mm for the adhesive. Mark a finish line across the top allowing 12.5mm for the thickness of the board and 10-15mm for the adhesive.

In case of uneven wall attach a framework of timber studs or metal channels to it before dry-lining. Fix the plasterboard to the studs or profiles with nails or screws rather than adhesive. You can also fit thermal insulation before fixing plasterboard, or use soundproof plasterboard.

If your wall is levelled use an adhesive to fix the plasterboard. Apply the adhesive on the wall and stick the plasterboard in line with your guide lines. Use the wooden batten to press the

plasterboard against the wall and self levelling tool to ensure it is perfectly vertical.

When applying plasterboards to the timber or metal framework, firstly mark on the floor and ceiling the positions of studs to easily find the fixing points. Cut plasterboard to the right measurements (start from wall to the centre of the doorway). Position the first plasterboard and secure it with KSGM or KSGD screws. Its edge should run down the centre of the stud above the doorway to avoid cracking. Apply screws every 150mm. Fix into noggings and studs in the middle of the sheet and at the edges. Use the drywall saw to cut the section of plasterboard that overlaps. If you cover the whole framework use plaster to fill any cracks or gaps between plasterboards and walls or ceiling.





### Timber system ceiling

Firstly it is important to note that this is an old fashioned method of ceiling installation. It is not recommended nowadays as it is not effective enough due to load transferring, being less resilient to cracks, absorbing moisture easily or being more difficult to level properly.

Timber system ceiling can be constructed with the use of battens. Using spirit level or other levelling tool, mark guide lines on walls for the new ceiling. To level the ceiling, attach battens to joists and noggings of the existing ceiling structure. Attach plasterboards to battens with dry lining screws.

### Metal frame ceiling

Metal frame ceiling is built with metal profiles, channels, connectors and brackets. For the ceiling grid construction most frequently are used metal profiles CD60 mounted in one- or two- level cross. Suspended ceiling hangers are ES brackets, hangers WSO with wire or joist hangers WKK. Ceiling can be lowered with ES brackets for profiles CD60 which are used to lower the ceiling from 75mm to 225mm. ES brackets are attached to joists or battens. To lower the ceiling from 10cm up to 2000mm-3000mm use the ceiling revolving hanger WSO and suspension wire. To create sloped ceiling

use joist hangers WKK. Attach wire to joists or battens and connect with WSO hanger. In the case of ceilings with fire protection hangers WSO noinius or ES should be used, while for the acoustic ceilings the **acoustic hangers**. Metal frame ceiling is constructed with the metal channels attached to the existing joists. Using spirit level or or laser, mark guide lines on walls for the new ceiling. Follow steps for the required ceiling type:

**Single metal grid ceiling system** - Install wall metal edge channels (perimeter profile UD27 or UD30), then fix brackets to the joints at intervals of 400mm for 2400 x 1200mm plasterboards. Attached channels to the brackets (main profile CD60) and then apply plasterboard with metal screws. Bracket high can be altered to level the ceiling appropriately.



**Single metal cross grid ceiling system** - Install wall metal edge channels (perimeter profile UD27 or UD30), then fix brackets to the joints at intervals of 400mm for 2400 x 1200mm plaster-

boards. Install channels (profile CD60) on brackets every 1.2-1.5meter and add additional metal channels (profile CD60) every 400mm on the cross brackets. Install plasterboard and dry lined. Bracket high can be altered to level the ceiling appropriately.



**Double metal cross grid ceiling system** - Same as the single metal cross grid system but on double metal channels (profile CD60). To achieve stronger ceiling construction use cross side connectors between main channels (profiles CD60). Such ceiling system is used for higher loading, for double plasterboards.





**Resilient metal grid ceiling system**

Resilient bars are designed to upgrade ceilings to Building Regulations Approved Document E acoustic standards, which will virtually eliminate the possibility of movement problems. Resilient metal grid improves the acoustic performance of the suspended ceiling.

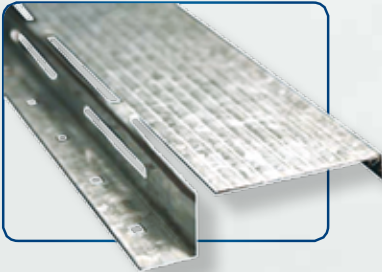
Resilient bars are installed directly on to the joists. Plasterboard is then installed directly to the resilient bar so there is no connection between plasterboard and the joists. This allows the resilient bars to vibrate and absorbs sound. This metal bar can provide the sound reduction of 10dB. Install resilient bars every 400mm directly to ceiling joists, first gap from wall should have no more than 200mm. Attach plasterboards to resilient bars with screws.

Acoustic hangers provide option of resilient suspension. They do similar job as resilient bars by stopping the direct connection of plasterboard which is fitted to the metal grid. Acoustic hangers allow for deeper depth between the suspended ceiling and the ceiling structure what allows the increased sound insulation. They reduce the airborne noise which gets to adjoining rooms or from the floor above.

Acoustic hanger



Resilient bar



| Solution         | Ceiling height loss        | Performance                                   | Impact improvement                                       | Airborne sound          |
|------------------|----------------------------|---|--|-------------------------|
| Acoustic hangers | 85-91mm (ceiling retained) | Good airborne (4db better than resilient bar) | Preferred over resilient bars where impact sound is high | Approx 18dB improvement |
| Resilient bars   | 29-35mm (ceiling removed)  | Medium airborne                               | Good   | Approx 16dB improvement |



### Fitting suspended tile ceiling

Suspended tile ceiling is a complete range of ceiling panels including mineral, soft fibre, wood or metal and a wide choice of suspension systems. There are various options of ceiling designs, materials and performances to meet the demand of architecture concepts. Suspended tile ceiling systems features include not only functionality but also design, acoustic features or environmental aspects.

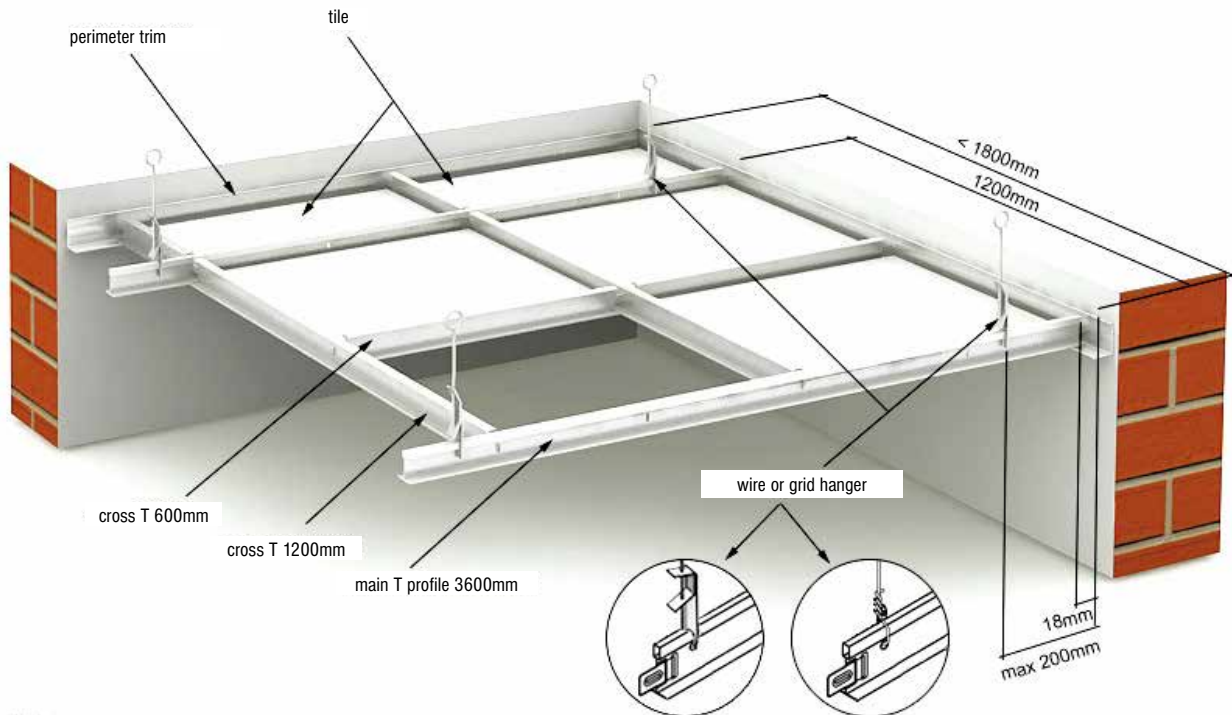
The suspension systems products include a full range of solutions for all ceiling suspension requirements: general applications, designer options, specific applications, perimeter trims and accessories for most applications. Suspension systems are designed for use with a wide variety of ceiling products- mineral, soft, metal, wood and our special solutions.

Suspended tile ceiling panels range is very broad and there is choice for both residential and commercial purposes. The commercial options are the most popular. Based on requirements there are varied mineral solutions available- laminated, non laminated and decorative options. Laminated range provides daylight optimisation, acoustical control and scratch resistance. The classic range of non laminated products is a mixture of performance, quality and affordability. The decorative range is all about modern geometric designs. Apart of mineral there are also soft fibre, wooden, metal or specific solutions to choose from.

There are options with visible grid or a fully concealed grid. For a fully concealed grid with mineral fibre tiles, there are planks or edges. Metal tiles can be installed on the 'clip-in' systems which do not expose the grid. If a semi-concealed grid is acceptable then any

'Vector' edge tiles in mineral, wood or metal are recommended. The minimum void depth for installing suspended ceilings depends on panels chosen. For 'lay-in' tile systems, where the tile is offered up through the grid before being dropped into place, about 150mm from the soffit to the top of the main runner bulb, is necessary. For edge tiles or clip-in tiles, which are installed from below the grid, less height is necessary. All services in the void, such as ducts, pipes or electrical cables may increase limits.

Briefly the installation of the suspended tile ceiling should start from marking the guide line on the walls, attaching wall angles and inserting tees and cross tees. In next steps suspending tees from the ceiling above using wires that can be adjusted to keep the framework level and at the final step -installing panels.



## METAL FRAME SYSTEM v TIMBER FRAME SYSTEM

1. Dry lining is an alternative method to plastering.
2. It costs less and is more effective than traditional plastering.
3. Metal frame system based on profiles is an alternative to traditional timber wall and ceiling construction.
4. Metal frame is quicker and easier to install, while it meets the highest performance requirements. It offers high strength to weight ratio for long lasting results.
5. Metal frame is more effective than timber one, especially in case of ceilings.
6. Metal frame system allows creating curves walls and arch ceilings easily.
7. In case of metal frame system it is not necessary to finish the whole surface with plaster, joints are enough.
8. Messy job of plastering is not required what cut costs and time.
9. Timber battens may be a cheaper solution but ceiling based on timber batten framework is less resilient and more prone to cracks.
10. Metal frame systems is up to 50% lighter than timber one, whilst it offers a more sturdy framework for plasterboard to be fixed.
11. Resilient metal grid improves the acoustic performance of suspended ceiling.
12. Metal profiles and channels are easier to transport. Can be stored outside and install in any weather conditions.
13. Metal profiles and channels are easy to cut on site, non flammable and will not rot or twist.
14. This is a quicker method of installation than using timber battens.
15. Metal stud frameworks enable the incorporation of insulation within the structure and offer same acoustic performance.
16. Metal won't bend, bow or differ in performance.
17. Metal studs are also less heavy then timber what cuts the installation time.



*To sum up dry lining (metal frame system) is a cost effective solution to build a new internal partition wall or ceiling, or to improve any existing wall or ceiling.*