



Housing



are you in the **know?**

KNAUF DRYWALL

HOUSING

Knauf Drywall systems – delivering solutions to meet customer needs

Knauf is a family owned company with approximately 18,000 employees worldwide.

Founded originally in Germany in 1932, Knauf entered the UK market in 1988 and was rebranded Knauf Drywall in 2003.

With two major manufacturing sites in the UK, Knauf Drywall is one of the leading suppliers of gypsum based materials in the UK. The UK manufacturing facilities are set up to adapt quickly to changing requirements and to offer maximum flexibility to suit specific needs. All production has the assurance of quality to BS EN ISO 9001: 2000.



Introduction and services	2-3
Single residence system application selection	4-5
Multiple residence system application selection	6-7
Design considerations	
Thermal	8-9
Fire	10-13
Acoustic	14-15
Ventilation and condensation	16
Specification tips	17
Design solutions	
Metal and timber	18-21
Masonry	22-25
Best practice detailing	26-29
Project profiles	30-31



Housing expertise

From initial concepts of housing specifications, where our Housing Managers are on hand to guide and assist, to our technical helpline, you are always guaranteed a rapid response to help solve any problems you may have.

This guide offers advice on the various design considerations specific to housing and offers a number of proposals for drywall design solutions. It is, however, merely a taste of the whole service which Knauf Drywall can offer.*

Service

At Knauf Drywall we understand and deliver the high level of service that our customers need and expect. Our flexible approach means that we do whatever we can to help, working within the framework of our customer's business.

Whatever the size or nature of the project, a professional member of the Knauf Drywall Team can always help.

Technical excellence

We are committed to continually providing superior, innovative technical solutions, not only with our products but with revolutionary support tools for our customers.

Quality

We take pride in the products and service we provide and recognise that the measure of quality will always be judged through the eyes of our customers. To this end, Knauf Drywall is committed to continually improving not only its products but also the performance of the business.

* The Knauf Drywall manual gives more information and can be accessed on line at:

www.knaufdrywall.co.uk/themanual



HOUSING

SYSTEM APPLICATION SELECTION **SINGLE RESIDENCE**

Knauf Drywall recognises that each part of a new dwelling holds unique challenges. To help you navigate this guide, the individual construction elements of a single dwelling and the appropriate page references for information relevant to them are detailed opposite.

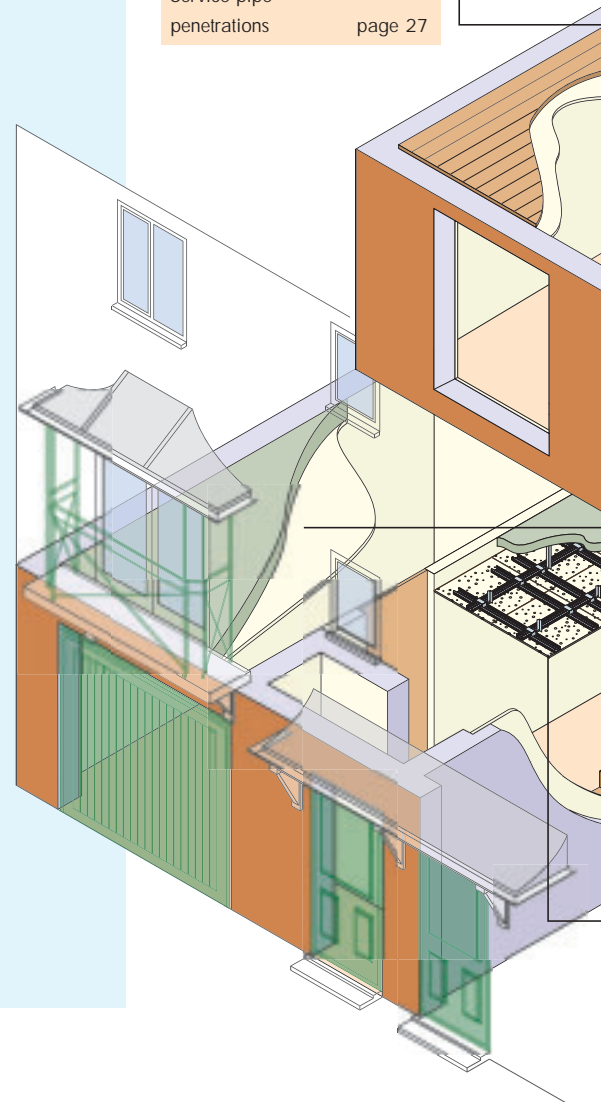
Internal floors

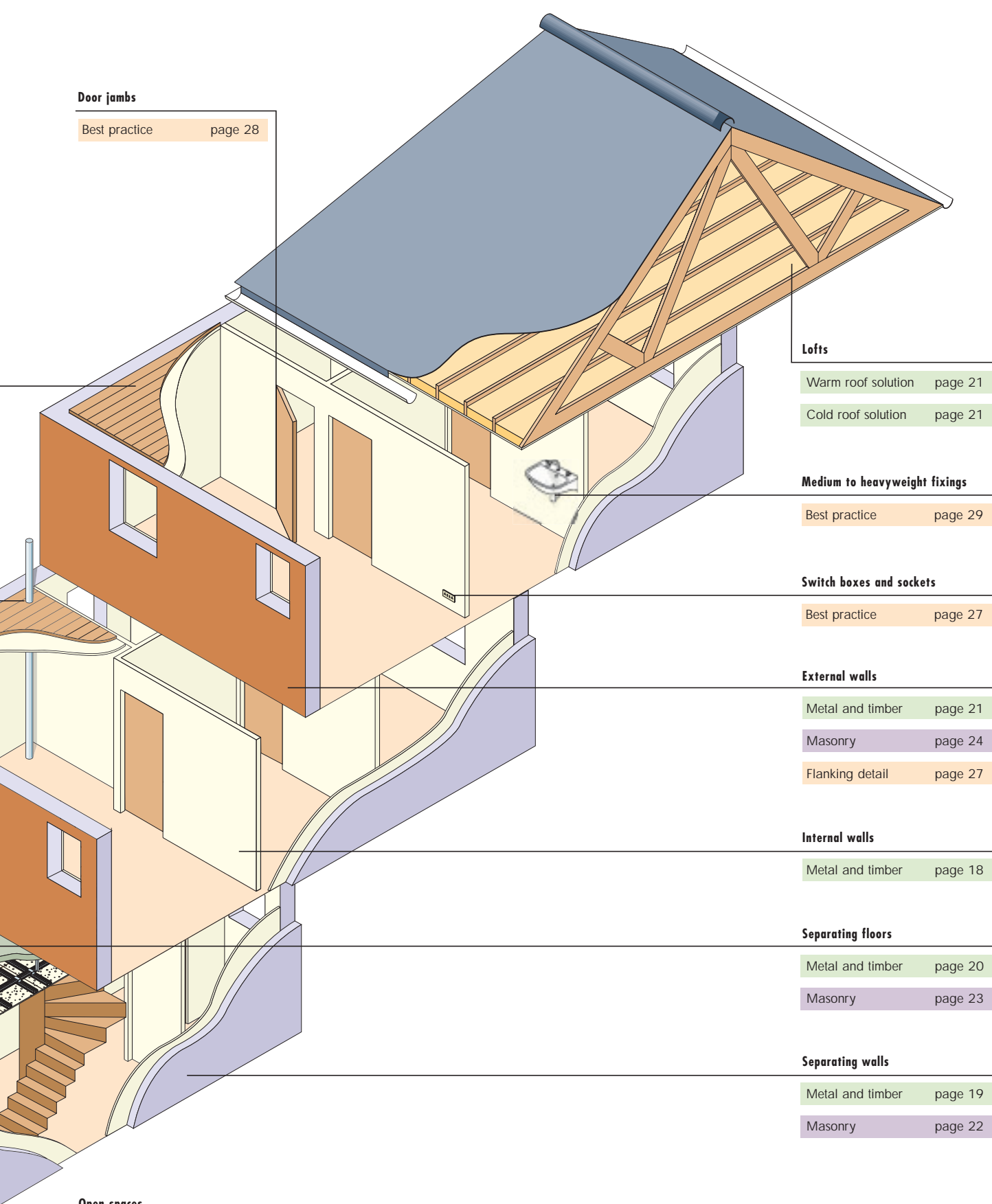
Metal and timber page 19

Internal floor junctions

With separating wall page 26

Service pipe penetrations page 27





Door jambs

Best practice page 28

Lofts

Warm roof solution page 21

Cold roof solution page 21

Medium to heavyweight fixings

Best practice page 29

Switch boxes and sockets

Best practice page 27

External walls

Metal and timber page 21

Masonry page 24

Flanking detail page 27

Internal walls

Metal and timber page 18

Separating floors

Metal and timber page 20

Masonry page 23

Separating walls

Metal and timber page 19

Masonry page 22

Open spaces

Masonry page 25


Partition interface with suspended ceiling page 26

HOUSING

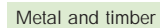
SYSTEM APPLICATION SELECTION **MULTIPLE RESIDENCE**

Multiple dwellings present different challenges to those of single dwellings, such as increased separating wall and floor requirements. Detailed here are the construction elements of a typical multiple dwelling and the appropriate page references for relevant information.

Communal areas:

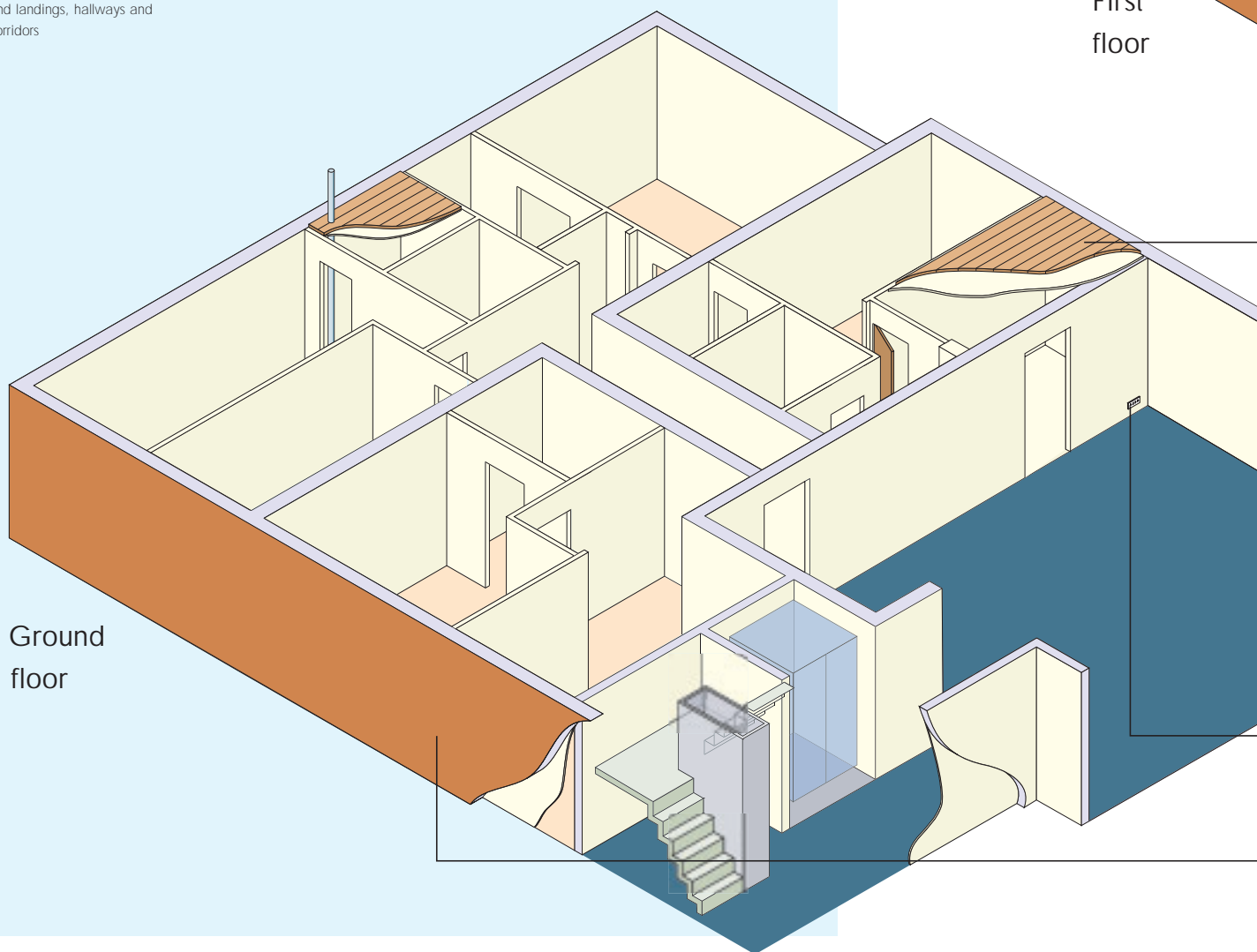
 Entrance lobbies, stairwells and landings, hallways and corridors

Internal walls

 Metal and timber page 18

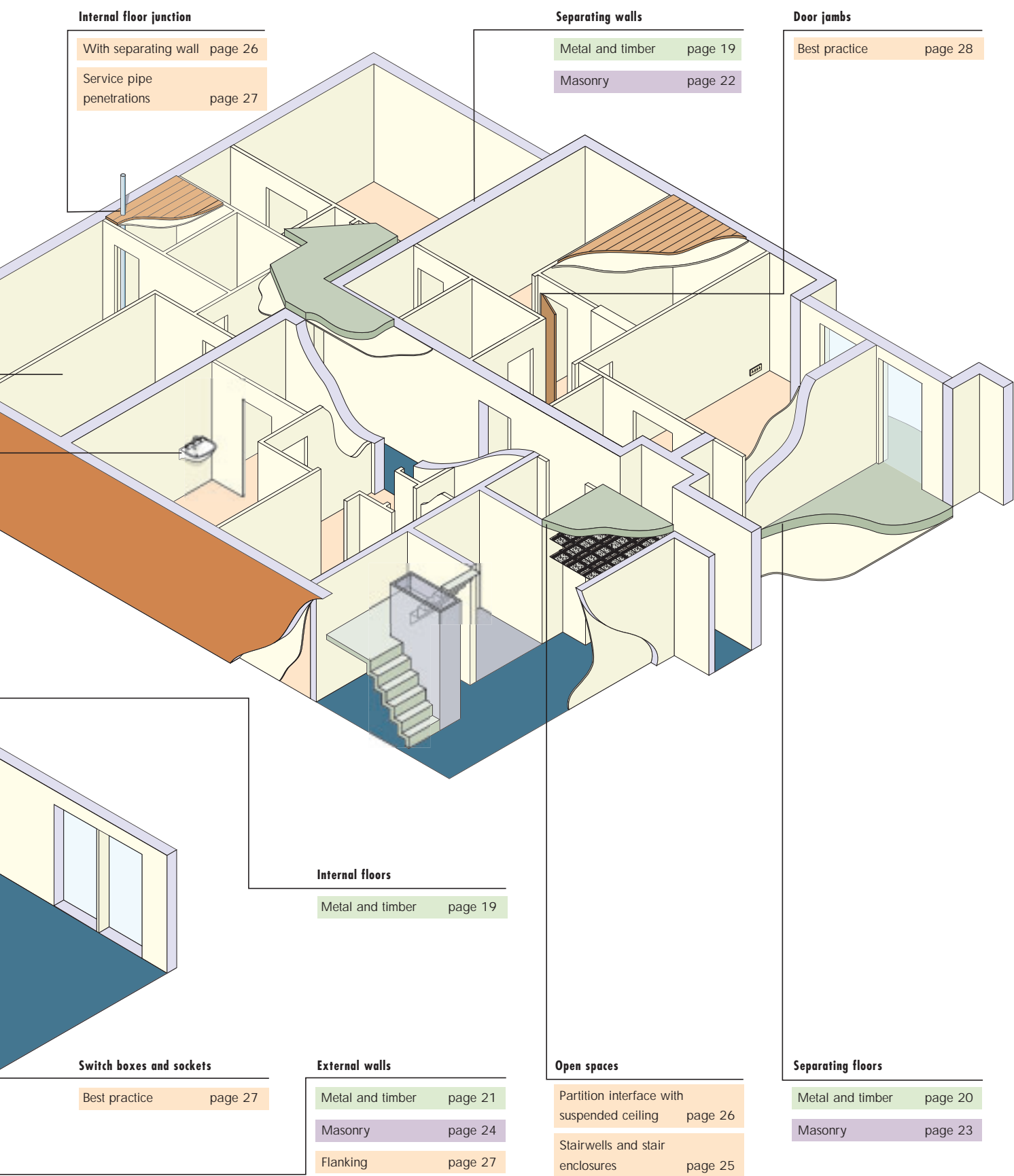
Medium to heavyweight fixings

 Best practice page 29



First floor

Ground floor



Internal floor junction

With separating wall page 26

Service pipe penetrations page 27

Separating walls

Metal and timber page 19

Masonry page 22

Door jambs

Best practice page 28

Internal floors

Metal and timber page 19

Switch boxes and sockets

Best practice page 27

External walls

Metal and timber page 21

Masonry page 24

Flanking page 27

Open spaces

Partition interface with suspended ceiling page 26

Stairwells and stair enclosures page 25

Separating floors

Metal and timber page 20

Masonry page 23

HOUSING

DESIGN CONSIDERATIONS

The following pages set out some of the construction and design issues that must be addressed when using Knauf Drywall products and systems for new and refurbishment housebuilding projects.

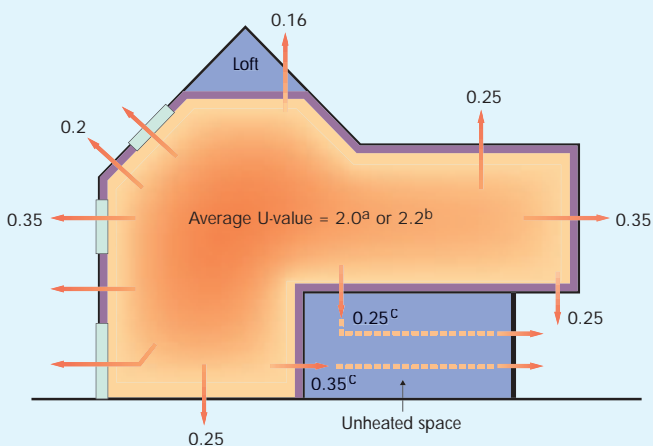
We have referred extensively to the appropriate Building Regulations, but due to limitations of space, have condensed their content to try to show information relevant to the specifiers and designers using this document.

In practice, the Building Regulations should be referred to as definitive guidance.

THERMAL CONSIDERATIONS

Fig. 1: Diagrammatic summary of Elemental Method

- Areas in which Knauf Drywall systems can be used
- a if windows have wood or PVC frames
- b if windows have metal frames
- c includes the effect of the unheated space



Relevant document

Building Regulations Approved Document L1 'Conservation of fuel and power in dwellings' for England and Wales and Part J for Scotland (April 2002).

Objectives of regulations

- i) Reduce emissions of green house gases emitted from dwellings by 12.5% in 2010 compared with emissions in 1990.
- ii) Also to reduce CO₂ emissions by 20% in 2010 compared with emissions in 1990.
- iii) Both the above are to be achieved by increased insulation efficiency along with enhancing construction practices to increase airtightness, heating and lighting efficiency.

The three calculation methods

Method 1 – Elemental

This method can be used for alterations, extensions and new-build work. Calculations are made for a selection of building elements which must comply with the U-value thermal performances shown in Table 1, opposite.

The Elemental method can be used with a heating system deemed to be efficient, for instance, gas or oil boiler heat pump, community heating with CHP or biogas or biomass fuel. Boiler efficiency is demonstrated by achieving gas SEDBUK values not less than those in Table 2. It can not be used for electric heating or other heating systems.

Method 2 – Target U-value

Here, an average U-value requirement is established for the building. This U-value is derived from the equation set out in the Building Regulations. There is a degree of latitude as to how this U-value is then met, which gives the designer some flexibility. This calculation method also takes into consideration solar gain, efficiency of heating system (any system can be



used), and the performance of glazed areas and doors.

Method 3 – Carbon index

This method requires that the carbon index (defined in the SAP – the Government Standard Assessment Procedure) for the dwelling(s) is not less than 8.0.

Assessment of compliance is by the calculation of the total energy use of the building. This, in turn, is derived from the U-values of construction elements, the type and efficiency of heating systems, ventilation etc.

Poorest U-values

For Methods 2 and 3, some elements may have a lower U-value than those shown in Table 1, provided that performance is compensated for in other areas and that risk of condensation is avoided. Table 3 below shows the permissible minima when using Methods 2 and 3.

Table 1 – Elemental Method: U-values (W/m²K) for construction elements

Exposed element	U-value requirement	U-value for Scotland only (using other heating systems)
Pitched roof with insulation between rafters ^{1,2}	0.2	0.18
Pitched roof with insulation between joists	0.16	0.16
Pitched roof with integral insulation	0.25	N/A
Flat roof ³	0.25	0.22
Walls, including ground floors and basement floors	0.35 (0.30 – Scotland)	0.27

Table 2 – Minimum boiler SEDBUK to enable adoption of the U-values in Table 1, and reference boiler SEDBUK for use in the Target U-value Method.

Central heating system fuel	SEDBUK (%) ⁴
Mains natural gas	78
LPG	80
Oil ⁵	85

Table 3 – Poorest U-values (W/m²K) for parts of elements acceptable as a general rule when using the Target U-value and Carbon Index Methods.

Element	Poorest acceptable U-value
Parts of roof ⁶	0.35
Part of exposed wall or floor	0.7

Notes to Tables 1, 2 and 3:

- Any part of a roof having a pitch of 70° or more can be considered as a wall.
- For the sloping parts of a room-in-the-roof constructed as a material alteration, a U-value of 0.3 W/m²K would be reasonable.
- Roof of pitch not exceeding 10°
- For boilers for which the SEDBUK is not available, the appropriate seasonal efficiency value from Table 4b of the SAP may be used instead (see paragraphs 0.17 - 0.18).
- For oil-fired combination boilers, a SEDBUK of 82%, as calculated by the SAP.98 method, would be acceptable.
- Whilst parts of these elements may (within the limits given in Table 3) have poorer U-values than those given in Table 1, it will not normally be practical to make sufficient allowances elsewhere in the design for the whole element to be built to these standards.

HOUSING



FIRE CONSIDERATIONS

Relevant document

Building Regulations Approved Document B, 2000 (amended 2002) edition. The parts relevant to this sector brochure are:

- B1: Means of warning and escape.
- B2: Internal fire spread (linings).
- B3: Internal fire spread (structure).
- B4: External fire spread.

Building Regulation requirements are:

B1 – To ensure the correct design, construction and provision of means of escape for persons in the event of a fire.

B2 – To ensure, through appropriate construction and workmanship, that firespread over the internal linings of buildings is inhibited.

B3 – To ensure the stability of buildings in the event of fire by creating separated compartments within buildings to inhibit internal spread of fire. To create sufficient and effective separation between adjoining buildings.

To inhibit unseen spread of smoke and fire via concealed spaces within buildings.

B4 – To restrict spread of fire from one structure to the next by constructing external walls and roofs that effectively inhibit firespread.

Complying with the regulations

Part B1, Section 2 – dwellinghouses

Houses below 4.5 m

For one or two storey houses, with a floor below 4.5 m above ground level, the Building Regulations demand that, in the event of a fire, early warning is provided and that suitable escape routes are available from each storey, but that these elements do not interfere with the day-to-day convenience of the occupants.

Generally speaking, points of risk such as cooking facilities and means of escape such as stairways or corridors are identified as requiring special consideration as far as fire-resisting construction is concerned.

Houses above 4.5 m

In houses with a floor or multiple floors above 4.5 m, it is necessary to provide additional escape routes (generally protected stairways unless over the roof) and exits.

Flats and Maisonettes below 4.5 m

Provisions are generally as for houses except that:

- i) Due to multiple occupancy, a high degree of compartmentation is required to reduce the probability of fire spreading beyond the dwelling in which it originates.
- ii) Where fires start in communal areas, the construction should be such that it minimises the spread of the fire.

Flats and Maisonettes above 4.5 m

As with houses over 4.5 m, the thrust of the Building Regulations is that additional escape routes be provided in the form of protected hallways or alternative exits. There is a further stipulation that any door to a habitable room is not more than 9 m from the entrance door.

Part B2 – Internal fire spread (linings)

Building Regulation requirements are: To inhibit the spread of fire within the building, the internal linings shall:

- a) Adequately resist the spread of flame over their surfaces.
- b) Have, if ignited, either a rate of heat release or a rate of fire growth, which is reasonable in the circumstances.

The above can be achieved by selection of materials, such as Knauf plasterboard, that have low rates of surface spread of flame. It is also beneficial for material to have a low rate of heat release, minimising the material's contribution to fire growth.

These qualities are particularly important in circulation or communal spaces, where it will often be linings that must minimise the spread of flame to give the occupants more escape time.

Table 4 – Classification of linings in residential situations

Location	National class	European class
Small rooms of area not more than: 4 m ² in residential accommodation;		
Domestic garages of area not more than 40 m ²	3	D-s3, d2
Other rooms (including garages)		
Circulation spaces within dwellings	1	C-s3, d2
Other circulation spaces, including the common areas of flats and maisonettes	0	B-s3, d2

Note to Table 4:

National classifications do not automatically equate with the equivalent classifications in the European column, therefore products cannot typically assume a European class, unless they have been tested accordingly.

Table 4, left, extracted (but modified) from the Building Regulations, indicates the classifications that linings should meet.

Part B3 – Internal fire spread (structure)

Building Regulation requirements are:

- i) The building shall be designed and constructed so that, in the event of fire, its stability will be maintained for a reasonable period.
- ii) A wall common to two or more buildings shall be designed and constructed so that it adequately resists the spread of fire between those buildings. For the purposes of this sub-paragraph, a house in a terrace and a semi-detached house are each to be treated as a separate building.
- iii) To inhibit the spread of fire within the building, it shall be sub-divided with fire-resisting construction to an extent appropriate to the size and intended use of the building.
- iv) The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.

The ultimate objective of the above, as with all fire considerations is, first to protect the lives of occupants, emergency workers, and those passing by or engaged in activities near to the building in question and, second, to try to minimise the structural damage.

The principal means of achieving the fire resistance of a construction element is to:

- a) Maintain the element's loadbearing capacity (resist collapse).

- b) Maintain the integrity of the elements (resist fire penetration).
- c) Provide insulation from high temperature (resist heat transfer).

Knauf products provide an efficient solution for many construction elements.

Compartmentation in dwellings

Sub-dividing dwellings into separate fire-resisting compartments is critical to the ability of the structure as a whole to prevent rapid fire spread and minimise the size of fires. Again, the overriding aim being to save lives and minimise destruction.

Knauf plasterboard systems are an effective method of achieving compartmentation in dwellings.

The Building Regulations state that:

Houses

- i) Every wall separating semi-detached houses, or houses in terraces, should be constructed as a compartment wall, and the houses should be considered as separate buildings.
- ii) If a domestic garage is attached to (or forms an integral part of) a house, the garage should be separated from the rest of the house, by providing 30 minutes fire resistance to any wall and floor between garage and house.

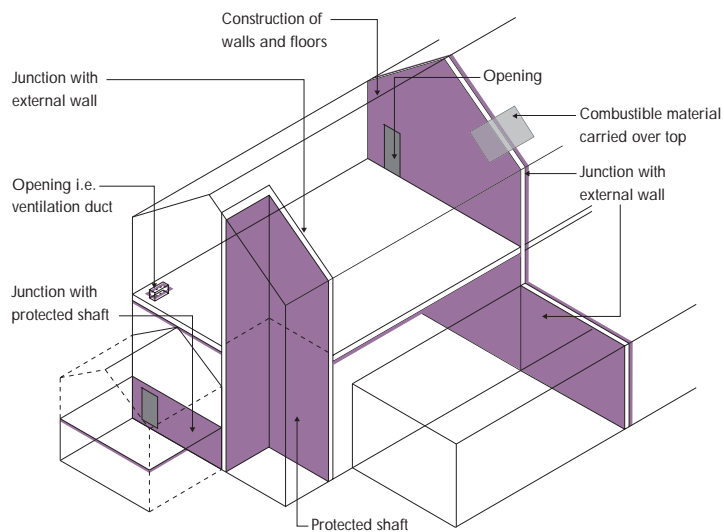
Any opening between garage and house must be a minimum 100 mm above floor level. See Fig. 2 and Table 5 overleaf.

Please see overleaf for more information on compartmentation in flats.



Fig.2: Diagrammatic summary of compartmentation

■ Compartment walls and floors in which Knauf Drywall systems can be used.



HOUSING



FIRE CONSIDERATIONS

Flats

In buildings containing flats or maisonettes, the following should be constructed as compartment walls or compartment floors:

- i) Every floor (unless within a maisonette, i.e. between one storey and another within one dwelling); and
- ii) Every wall separating a flat or maisonette from any other part of the building* ; and
- iii) Every wall enclosing a refuse storage chamber.

* 'any other part of the building' does not include an external balcony / deck access.

Other residential buildings

All floors should be constructed as compartment floors.

Loft conversions

In a dwelling where only one storey is being added, there are no more than 2 habitable rooms and the total area

is not more than 50 m², the existing first floor construction must have at least a modified 30 minutes fire resistance where the floor separates only rooms (not circulation spaces).

In other circumstances, the full 30 minute standard is required. See Table 5 opposite.

Other considerations

Concealed spaces (cavities)

Concealed spaces or cavities in the construction of a building provide a ready route for smoke and flame spread. This is particularly so in the case of voids above other spaces in a building, e.g. above a suspended ceiling or in a roof space. As any spread is concealed, it presents a greater weakness in the fabric of the building. Provisions are made to restrict this by interrupting cavities which could form a pathway around a barrier to fire, sub-dividing extensive cavities, and by closing the edges of openings.

Protected shafts

Any stairway or other shaft passing directly from one compartment to another should be enclosed in a protected shaft so as to delay or prevent the spread of fire between compartments.

Knauf Drywall offers a comprehensive range of shaftwall solutions. For further information, please refer to the 'Manual'.

External walls

The requirement is for sufficient fire-resistance to prevent fire spread across the relevant boundary. If an external wall is more than 1 metre from the relevant boundary, the wall only needs fire resistance from the inside.

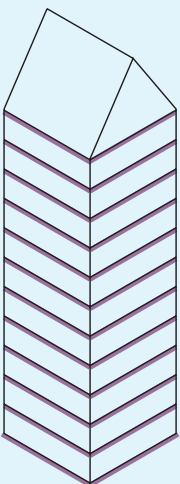



Fig. 3: Buildings over 30 m in height
In a building over 30 m in height, all storeys should be separated by compartment floors.

 Areas where Knauf Drywall systems can be used

With cavity barriers

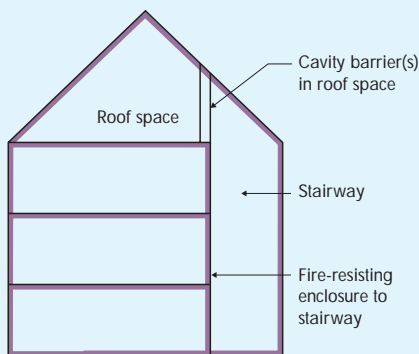



Fig. 4: Arrangements of compartmentation in a house over 4.5 m high

 Areas where Knauf Drywall systems can be used

With fire-resisting ceiling

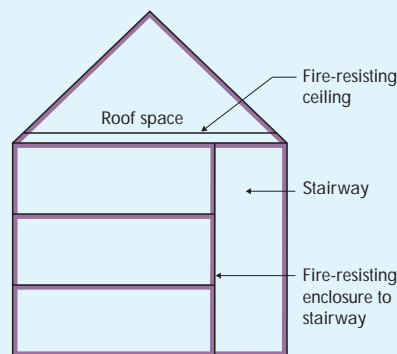


Table 5 – Fire resistance required for elements of structure ¹

Minimum provision when tested to the relevant parts of BS 476 ² / EN 1363				
Part of building	Loadbearing capacity ³	Integrity minutes	Insulation minutes	Method of exposure
Loadbearing wall (which is not a compartment wall)	see table 6	N/A	N/A	Each side separately
Floors ⁴				
a) in upper storey of two-storey dwelling house (but not over a garage or a basement)	30	15	15	From the underside ⁵
b) any other floor including compartment floors	see table 6	see table 6	see table 6	
External walls				
a) any part less than 1m from any point on the relevant boundary.	see table 6	see table 6	see table 6	Each side separately
b) any part 1m or more from relevant boundary ⁶	see table 6	see table 6	15	From inside of the building
c) any part adjacent to an external escape route	30	30	No provision ⁷	From inside of the building
Compartment walls (separating occupancies)	60, or see table 6	60, or see table 6	60, or see table 6	Each side separately
Compartment walls (not separating occupancies)	see table 6	see table 6	see table 6	Each side separately
Garage wall (separating an attached garage side or integral garage from a dwelling house)	30	30	30	From the garage side
Fire-resisting construction (in dwellings not described elsewhere)	30	30	30	Each side separately

Notes to Table 5:

- This table covers the most common requirements affecting housing. For a comprehensive listing, reference should be made to the Building Regulations.
- BS 476: Part 21 for loadbearing elements, Part 22 for non-loadbearing elements, Part 23 for fire-protecting suspended ceilings. BS 476: Part 8 results are acceptable for items tested or assessed before 1st January 1998.
- Applies to loadbearing elements only (see B3.ii and Appendix on the Building Regulations).
- Guidance on increasing the fire resistance of existing timber floors is given in BRE Digest 208 'Increasing the fire resistance of existing timber floors' (BRE 1998).
- A suspended ceiling should only be relied on to contribute to the fire resistance of the floor if the ceiling meets the appropriate provisions given in Table A3 of the Building Regulations.
- The guidance in Section 14 of the Building Regulations allows such walls to contain areas which need not be fire-resisting (unprotected areas).
- Unless needed as part of a wall in 'External Walls' a or b.

Modifications referred to in Table 6:

- The floor over a basement (or if there is more than 1 basement, the floor over the topmost basement) should meet the provisions for the ground and upper storeys if that period is higher.
- Increased to a minimum of 60 minutes for compartment walls separating buildings.
- Reduced to 30 minutes for any floor within a maisonette, but not if the floor contributes to the support of the building.
- Refer to paragraph 8.11 of the Building Regulations regarding the acceptability of 30 minutes in flat conversions.
- 30 minutes in the case of 3 storey dwelling-houses, increased to 60 minutes minimum for compartment walls separating buildings.
- Refer to paragraph 8.10 (page 63 of the Building Regulations) regarding the acceptability of 30 minutes in flat conversions.

Table 6 – Minimum periods of fire resistance

Purpose group of building	Minimum periods (minutes) for elements of structure in a:					
	Basement storey ⁸ including floor over depth (m) of a lowest basement			Ground or upper storey height (m) of top floor above ground in a building or separated part of a building		
	more than 10	not more than 10	not more than 5	not more than 5	not more than 18	more than 30
1) Residential (domestic):						
a) Flats and maisonettes	90	60	30 ⁹	60 ^{10,11}	90 ¹⁰	120 ¹⁰
b) and c) dwellinghouses	N/A	30 ⁹	30 ⁹	60 ¹²	N/A	N/A
2) Other residential	90	60	30 ⁹	60	90	120 ¹³

HOUSING



ACOUSTIC CONSIDERATIONS

Relevant document

Building Regulations Approved Document E "Resistance to the passage of sound". The parts relevant to this sector brochure are:

- E1: Protection of sound from other parts of the building and adjoining buildings.
- E2: Protection against sound within a dwelling house.
- E3: Reverberation in the common internal parts of buildings containing flats or rooms for residential purposes.

Objectives

To improve modern living standards by the provision of resistance to sound from other buildings, parts of the same building and the reduction of reverberation from common parts of buildings.

The above is to be achieved by a range of enhanced requirements for the construction of walls, floors and ceilings for new build and material change of use projects.

Pre-Completion Testing

Part E puts the onus on the builder to demonstrate that the stated

acoustic rating has been achieved by demanding that 10% of all new dwellings should be Pre-Completion Tested on-site.

Testing applies to separating walls and floors between dwellings. Both new build dwellings and those new dwellings created by what Part E describes as "Material Change of Use", are covered. Material change of use relates to what would be more commonly known as refurbishment and conversion work.

Testing must be carried out by a test body with appropriate third party accreditation.

In new build situations, the use of Robust Details (see below) obviates the requirements for mandatory Pre-Completion Testing.

Pre-Completion Testing is not required for internal partitions and floors.

Robust Details

To avoid the need for Pre-Completion Testing, the industry, and in particular housebuilders, led by the HBF, have won approval of a series of performance-tested solutions which are

deemed to satisfy Part E. In relation only to separating walls and floors, these solutions are site-tested systems – proven to achieve required performance levels – and are known as Robust Details. Sites taking advantage of these solutions must be registered with Robust Details Ltd.

There are also suggested constructions within Part E itself for separating elements. However, these systems are still subject to Pre-Completion Testing. Several of these systems specify the use of 10kg plasterboard which Knauf Drywall can supply from our range of boards.

Where practical, Knauf Drywall recommends the use of Robust Details to avoid mandatory Pre-Completion Testing in new-build situations.

Dealing with reverberation in 'common parts' of residential buildings

Part E3 of the Building Regulations concerns the reduction of reverberation and applies only to corridors, staircases, hallways and entrance halls giving access to flats or rooms for residential purposes. Reverberation is

Technical Data

dB (decibel)

indicates the level of sound reduction required.

R_w

Laboratory measurement of airborne sound transmission

D_{nT}, w + C_{tr}

Site measurement of airborne sound with low frequency correction applied. The higher the figure, the better the performance.

L'_{nT}, w

Site measurement of impact sound level. The lower the figure, the better the performance.

Part E summary of requirements:

Table 7 – Dwelling Houses & Flats: separating walls, floors and stairs

	Airborne Sound Insulation D _{nT} , w + C _{tr} dB (minimum values)	Impact Sound L' _{nT} , w dB (maximum values)
New build		
Walls	45	–
Floors and stairs	45	62
Material change of use		
Walls	43	–
Floors and stairs	43	64

Table 8 – Laboratory Values for new internal walls and floors

	Airborne Sound Insulation R _w dB (minimum values)
New Build	
Walls	40
Floors	40
Material change of use	
Walls	40
Floors	40

Fig. 5: Insulation requirements for E1 (Table 7), separating elements

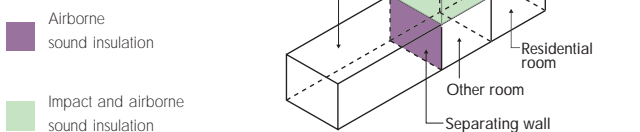


Fig. 6: Insulation requirements for E2 (Table 8), internal elements



defined as the persistence of sound in a space after the source of the sound has stopped.

The 'common' parts of residential structures are deemed to require additional levels of sound absorption.

There are two methods of achieving the requirements:

Method A

Cover a specified area with an absorptive material of an appropriate class, rated according to BS EN ISO 11654: 1997 'Acoustics – sound absorbers for use in buildings – rating of sound absorption'.

For entrance halls, corridors or hallways

Cover an area equal to or greater than the floor area with a class C absorptive material. Usually, this area will be the ceiling.

For stairwells and stair enclosures

Calculate the combined area of: stair treads, upper surfaces of intermediate landings, upper surfaces of landings (not ground floor) and ceiling area of top floor.

There are then two options:

- use a class D absorptive material to cover an area at least equal to the calculated area.
- use a class C absorptive material, or better, to cover at least 50% of the calculated area.

In either case, ensure even distribution of the absorptive material – normally the underside of intermediate landings, other landings and the ceiling of the top floor.

Proprietary acoustic ceilings, such as Knauf Apertura, will generally satisfy Method A, but other absorptive material can be applied to any surface that faces into the space.

Method B

This method takes into account the existing absorption provided by all surfaces, and can provide more design flexibility, or require less additional absorption than method A.

Its requirements are:

For entrance halls

provide a minimum of 0.20 m² total absorption area per cubic metre of the volume, distributed over available surfaces.

For corridors or hallways

as above but a minimum of 0.25 m².

The Building Regulations provide a formula for the calculation of the total absorption area (A_T) (for full details see section 7 of Part E, page 65), and are satisfied when the appropriate amount of absorption area is provided for each octave range between 250 Hz and 4000 Hz inclusively.

Table 9, below, contains typical absorption coefficient material data for plaster and plasterboard.

For other materials, measurements of absorption coefficient data should be determined using BS EN 20354: 1993 and according to BS EN 11654:1997.

Definitions

New build

Any new, purpose-built construction project. Extensions, as new constructions, fall into this category.

Material change of use

Defined as "where there is a change in the purpose for which or circumstances in which a building is used". This could be an office converted to a residence,

a shop altered to contain a flat, a house converted to flats etc.

Exceptions

Dwellings sold before fitting out

Part E specifies that measurement of sound insulation should be made between the available spaces and that steps should be taken to ensure that fitting out will not adversely affect the sound insulation. Appropriate steps are not defined in Part E.

Historic buildings

Part E leaves it to Building Control Officers to ensure that "everything reasonable has been done", although this is not defined in Part E. A notice must be displayed within the building to show the sound insulation levels achieved by testing.

Loft conversions

No guidance is given in Part E.

Table 9 – Absorption coefficient data for common materials in buildings (as set out in the Building Regulations)

Material	Sound absorption coefficient (α), in octave frequency bands (Hz)				
	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Suspended plaster or plasterboard ceiling (with large airspace behind)	0.15 α	0.10 α	0.05 α	0.05 α	0.05 α

HOUSING

VENTILATION & CONDENSATION CONSIDERATIONS



Relevant document

Building Regulations approved document 1991 (1995 Edition).

- F1: Means of ventilation.
- F2: Condensation.

Objectives

To encourage construction that provides adequate means of ventilation in dwellings and, closely linked with the above, to prevent excessive condensation in roofs and roof voids above insulated ceilings.

Meeting the requirements

F1 requirements can be met by providing the appropriate levels of mechanical and background ventilation for the designated room types – habitable rooms, kitchens, common spaces, bathrooms and sanitary accommodation – each having specific stipulations.

F2 is split into two types of construction:

Roofs with a pitch of 15° or more (pitched roofs)

This category is generally classified as a 'cold roof' where there is insulation at ceiling level and an unheated, uninhabited loft space above it.

The regulations require that the roof space should have eaves ventilation running the full length of the eaves promoting cross-ventilation eaves to eaves equivalent to a continuous 10 mm opening.

Roofs with a pitch of less than 15° and those where the ceiling follows the pitch of the roof

Flat roofs and pitched roofs, where the insulation follows the pitch of the roof (often referred to as 'warm roofs'), require ventilation on two opposite sides. The level of ventilation should have an area at least equal to continuous ventilation running the full length of the eaves and 25 mm wide.

The void between the roof deck and the insulation should have a free airspace of at least 5 mm. Counter battens may be used where joists run at right angles to air flow direction.

Pitched roofs also require 5 mm continuous ventilation at the ridge line.

Vapour checks can reduce the amount of moisture condensing in the void, but cannot be relied on as an alternative to ventilation unless a complete barrier to moisture can be guaranteed.

Summary

'Cold' duo-pitched roof (Fig. 7)

On each side of the roof a free airspace equivalent to a continuous 10 mm opening is required at the eaves or at low level.

'Warm' duo-pitched roof (Fig. 8)

On each side of the roof a free airspace equivalent to a continuous 25 mm opening is required at the eaves or at low.

A free airspace equivalent to a continuous 5 mm opening should also be provided at the ridge or at high level on each slope.

A minimum 50 mm clear air path must always be maintained between the insulation and the underlay to ensure effective through-ventilation.

Fig. 7: 'Cold' duo-pitched roof

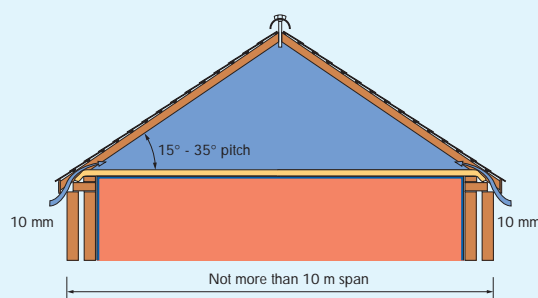
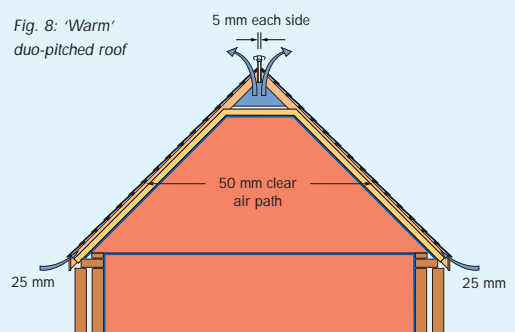


Fig. 8: 'Warm' duo-pitched roof



SPECIFICATION TIPS

Metal studs – speed, accuracy and economy

The specification of metal studs gives particular advantages over timber:

- Reduced waste.
- Increased speed and ease of erection.
- Higher accuracy, no movement or twisting due to shrinkage.
- Reduced customer care issues.

There is also a greatly reduced chance of use by other trades for non-associated tasks. In the case of internal partitions, the use of Knauf Acoustic C Stud can obviate the need for an insulation quilt. Always ensure that Knauf Drywall metal studs are used within Knauf Drywall partition systems to ensure the validity of all performance ratings and the warranty.

Paper tape

Always specify the use of Knauf Joint Tape for jointing plasterboards in ceiling applications. The use of paper tape significantly reduces the chances of cracking due to movement of the background.

Reducing wastage

Wastage of plasterboard on sites can be reduced by ensuring that the correct board length is chosen to suit the storey heights. Often, over-length boards are specified which then have to be cut-down, increasing working time and waste.

For further information on waste management, please refer to our Environmental brochure, available from our Literature Hotline: 08700 631 700.

Resilient bar for ceilings

The specification of Knauf Resilient

Bar on ceiling systems brings three advantages:

- Sound reduction is increased (in some cases, obviating the need for an insulation quilt).
- The bars can be spaced to remove the need for noggings on 12.5 mm board, regardless of joist centres.
- Instances of cracking / nail popping are much reduced as the system will be more tolerant of background movement.

Recessed lights and other penetrations

When specifying recessed lighting and other penetrations through walls and ceilings, consider the effect on the system's performance with regards to fire and acoustic ratings. Always ensure the manufacturer of the penetration has taken these into account.

Ensuring effective adhesion for 'dot and dab'

When specifying a 'dot and dab' plasterboard solution to fair faced in-situ concrete, it is necessary to take into account the releasing agent used, as well as the low-key, low-suction surface. The concrete should be allowed to fully dry, and all traces of releasing agent removed with a mild detergent. Knauf Betokontakt should be used to provide a key, before the wall can be lined using a Knauf Drywall 'dot and dab' solution.

Achieving high finish levels

When deciding on which finish to apply to plasterboard, consideration should be given to the level of flatness that is required so that it suits the interior design and lighting conditions. For example, natural light at a shallow angle tends to highlight surface level



differences, and features such as dado rails require a uniformly flat surface in order to be correctly mounted.

On a taped and jointed finish, the maximum increase of the crown of the joint allowed in BS 8212:1988 is 3 mm when measured using a 450 mm straight edge. A smaller maximum increase can be specified, but will be more time-consuming to achieve. The use of Knauf Tapered Edge plasterboards is recommended when taping and jointing. If a uniformly flat surface is required then a Knauf skim plaster finish should be specified.

If specifying a taped and jointed plasterboard finish, Knauf Wallboard Primer should be applied prior to the final finish (paint or wallpaper). The use of Wallboard Primer equalises suction across the surface and reduces the chance of the joints being seen through the finish. It also reduces moisture absorption and the risk of discolouration.

When checking the standard of jointing prior to completion, the use of lighting similar to that expected

when occupied will provide the most accurate check, and subsequently reduce the possibility of customer care issues relating to the finished surface.

Sequence

The British Standard Code of Practice for plasterboard partitions and dry linings (BS 8000: Part 8: 1994) recommends the following sequence of work:

Fix ceiling linings first, then partitions, followed by wall linings. Whenever it is practical to do so, apply wall linings in sequence working away from doors and windows and towards internal angles. As far as possible, locate paper bound board edges at salient corners.

Please note that where a parge coat is specified to a masonry separating wall, then the parge coat should be applied first, before the ceiling lining, and should cover all exposed masonry.

HOUSING

DESIGN SOLUTIONS

When designing dwellings, there are various requirements that must be met. Identifying the appropriate solutions can sometimes be confusing. Recognising this, Knauf Drywall has devised a simple, cost effective range of solutions.

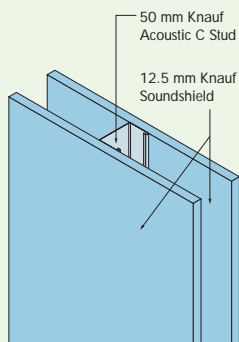
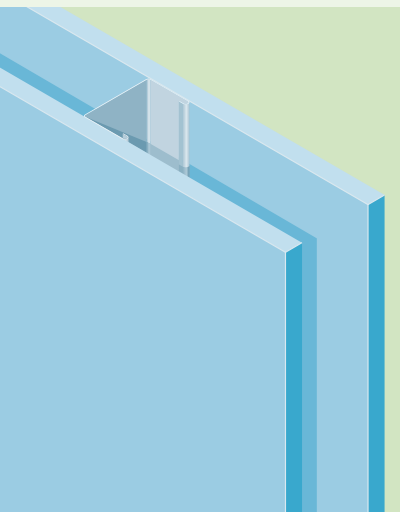
Detailed in this section is a range of solutions that you can specify with confidence.

KNAUF DRYWALL SOLUTIONS: METAL AND TIMBER

(For Masonry solutions, see page 22)

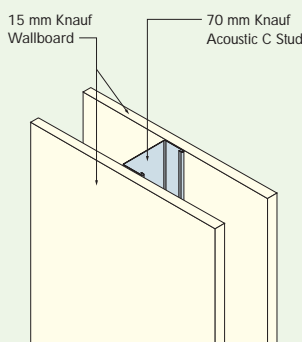
Internal walls

These are laboratory tested Knauf Drywall proprietary systems that meet the legal requirements for acoustic and fire performance as laid down in the Building Regulations. All systems have a maximum 3000 mm height.



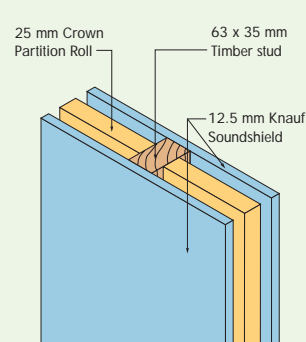
Solution 1

- 12.5 mm Knauf Soundshield
- 50 mm Knauf Acoustic C Stud at 600 mm centres.
- 30 minutes fire resistance
- 40 dB Rw airborne sound



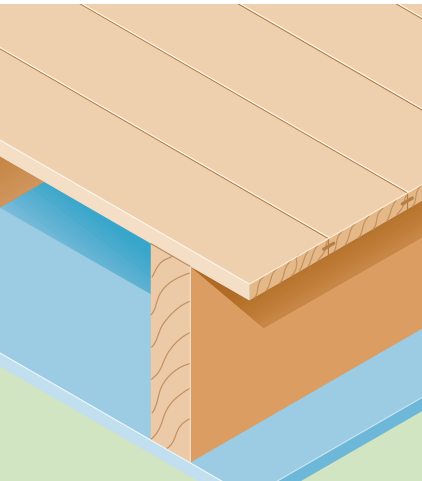
Solution 2

- 15 mm Knauf Wallboard
- 70 mm Knauf Acoustic C Stud at 600 mm centres
- 30 minutes fire resistance
- 40 dB Rw airborne sound



Solution 3

- 12.5 mm Knauf Soundshield
- 63 mm timber stud at 600 mm centres
- 25 mm Crown Partition Roll
- 30 minutes fire resistance
- 40 dB Rw airborne sound

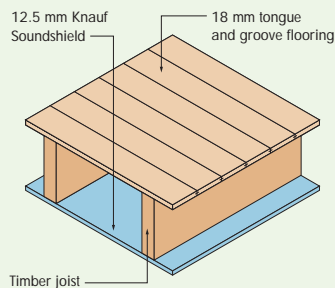


Note to Internal floors:

1 600 mm centres may be used with noggings, or if 15 mm Knauf plasterboard is specified, without noggings.

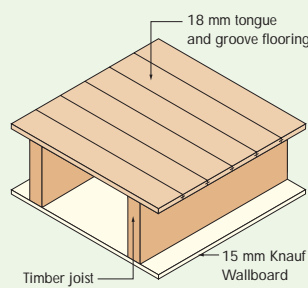
Internal floors

These are laboratory tested Knauf Drywall proprietary systems that meet the legal requirements for acoustic and fire performance as laid down in the Building Regulations.



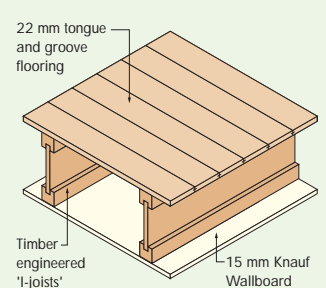
Solution 1

- 12.5 mm Knauf Soundshield to underside of timber joists¹.
- 30 minutes fire resistance
- 40 dB Rw airborne sound



Solution 2

- 15 mm Knauf Wallboard to underside of timber joists.
- 30 minutes fire resistance
- 40 dB Rw airborne sound



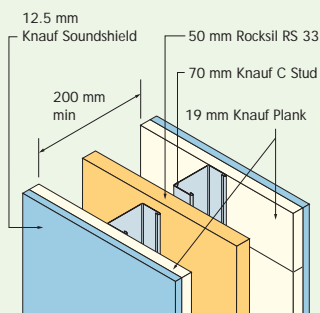
Solution 3

- 15 mm Knauf Wallboard to underside of timber engineered I-joists.
- 30 minutes fire resistance
- 40 dB Rw airborne sound



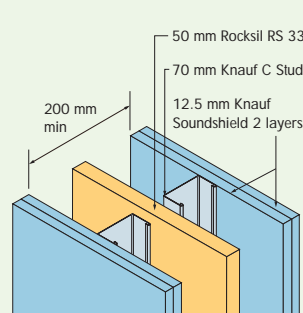
Separating walls

These systems all comply with Robust Details Ltd for Part E of the Building Regulations. Pre-Completion Testing is still required for Robust Detail solutions unless the site is registered with Robust Details Ltd. All systems have a maximum 3000mm height.



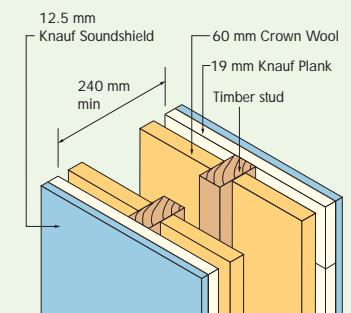
Solution 1 (E-WS-1)²

- 12.5 mm Knauf Soundshield (outer layer, mounted vertically) and 19 mm Knauf Plank (inner layer, mounted horizontally), all layer joints staggered.
- Twin frame, 70 mm Knauf C Studs at 600 mm centres, braced accordingly, in separate Knauf U-channels, spaced to give minimum 200 mm cavity width.
- 50 mm Rocksil RS33 insulation slab mounted between the rows of studs
- 60 minutes fire resistance
- 45 DnT, w + Ctr dB airborne sound on-site³



Solution 2 (E-WS-1)²

- 2 layers 12.5 mm Knauf Soundshield (outer layer mounted vertically, inner layer mounted horizontally) each side, all layer joints staggered.
- Twin frame, 70 mm Knauf C Studs at 600 mm centres, braced accordingly, in separate Knauf U-channels, spaced to give minimum 200 mm cavity width.
- 50 mm Rocksil RS33 insulation slab mounted between the rows of studs.
- 60 minutes fire resistance
- 45 DnT, w + Ctr dB airborne sound on-site³



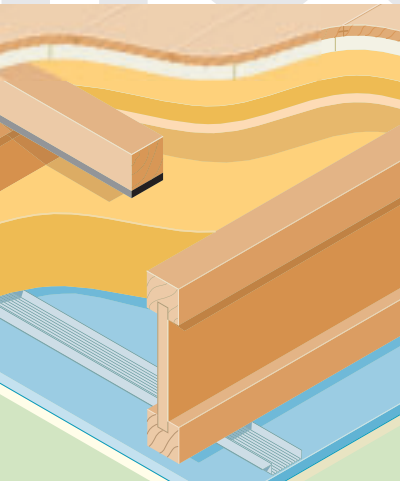
Solution 3 (E-WT-1)²

- 12.5 mm Knauf Soundshield (outer layer, mounted vertically) and 19 mm Knauf Plank (inner layer, mounted horizontally), all layer joints staggered.
- Twin frame, two rows of timber studs at max. 600 mm centres, spaced to give minimum 240 mm cavity width.
- 60 mm Crown Wool Insulation mounted between studs on each frame.
- 60 minutes fire resistance
- 45 DnT, w + Ctr dB airborne sound on-site³

Notes to Separating walls:

2 For further information on the specification of Robust Details, refer to Knauf Drywall Technical Services.
3 Airborne sound on-site figures are the Building Regulation's minimum requirements as tested on-site. Each of these solutions has the potential to significantly exceed this figure when correctly installed.

HOUSING



Notes to Separating floors:

- 4 For further information on the specification of Robust Details, refer to Knauf Drywall Technical Services.
- 5 Airborne and impact sound on-site figures are the Building Regulations' minimum requirements as tested on-site. This solution has the potential to significantly exceed this figure when correctly installed.
- 6 Airborne and impact sound figures for this system are laboratory tested. This system has the potential to exceed the Building Regulations' minimum requirements when tested on-site.

Separating floors

Solution 1 complies with Robust Details Ltd for Part E of the Building Regulations. Pre-Completion Testing is still required for Robust Detail solutions unless the site is registered with Robust Details Ltd.

There is currently no proposed Government detailed Robust Standard Detail for Part E of the Building Regulations to suit the use of non-engineered timber 'I-joists' (ie. traditional timber joists). Solution 2 is a Knauf Drywall recommended solution which has been laboratory tested, but is subject to possible further Pre-Completion Testing, if specified.

Solution 1 (Robust Detail) (E-FT-1)⁴

Floating Floor Treatment:

- 18-22 mm flooring board on 19mm Knauf Plank, over resilient composite deep battens with 25 mm Crown Partition Roll between (not under).
- Resilient battens sized to give 70 mm minimum void when loaded.

over

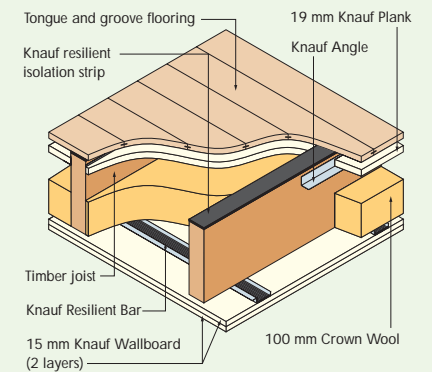
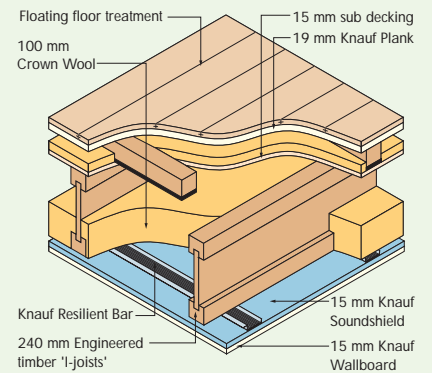
Timber Floor:

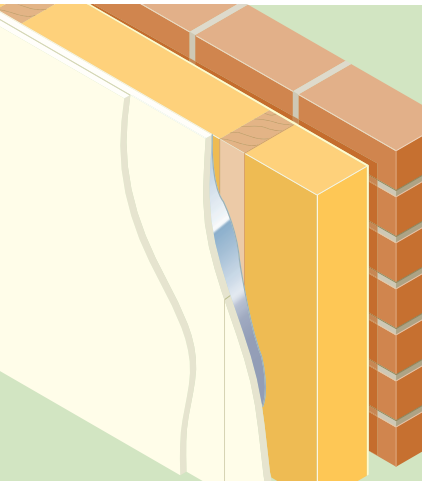
- Minimum 15 mm sub-decking over minimum 240 mm engineered timber 'I-joists'.
- 100 mm Crown Wool insulation between joists. Knauf Resilient Bars at 400 mm centres mounted perpendicular to joists.
- Upper layer 15 mm Knauf Soundshield and lower layer 15 mm Knauf Wallboard fixed to resilient bars.
- 60 minutes fire resistance
- 45 DnT, w + Ctr dB airborne sound on-site⁵
- 62 L'nT, w dB impact sound on-site⁵

Solution 2 (Knauf Drywall recommended solution)

Timber Floor:

- 18-22 mm flooring glued to Knauf resilient isolation strip over the top surface of the joist.
- 19 mm Knauf plank mounted on Knauf Angles between the joists.
- 100 mm Crown Wool insulation between joists.
- Knauf Resilient Bars at 400 mm centres mounted perpendicular to joists.
- 2 Layers 15 mm Knauf Wallboard fixed to resilient bars.
- 60 minutes fire resistance
- 56 dB Rw airborne sound (lab test)⁶
- 61 L'nT, w dB impact sound⁶





Notes to External walls:

- 7 Ground storey loadbearing wall, height of top floor above ground not more than 18 m.
- 8 Specific airborne sound performance may be required, subject to local planning requirements.

External walls

The inner plasterboard linings of loadbearing timber external walls play an important role in the fire performance of the wall, as well as providing both an effective vapour barrier (when Knauf Vapourshield is specified as the inner layer) and the decorative internal face.

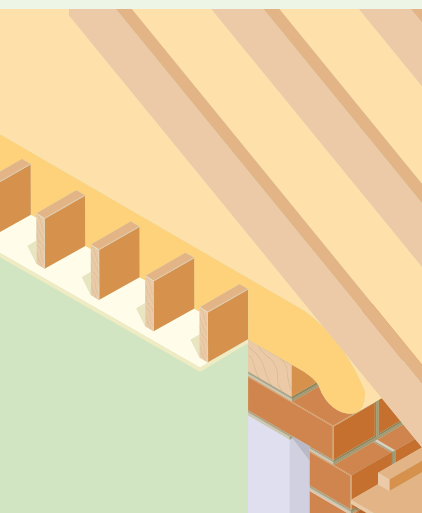
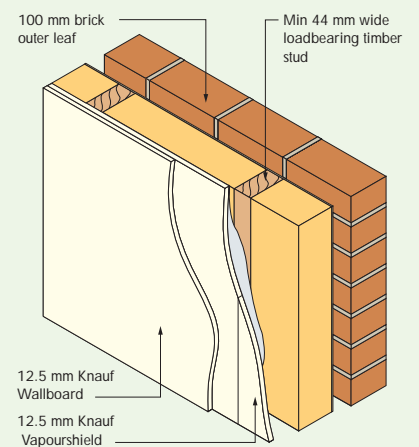
Solution

Internal lining with plasterboard:

- Standard timber loadbearing construction with brick outer leaf, minimum 44 mm timber studs at maximum 600 mm centres, stud depth to suit insulation.
- Insulation between studs to suit U-value.

Inner lining:

- 2 layers of 12.5 mm Knauf plasterboard with staggered joints. Inner layer to be Knauf Vapourshield.
- 60 minutes fire resistance ⁷
- Airborne sound (dB Rw) N / A ⁸
- 0.35 W / m²K U-value (0.3 Scotland)



Notes to Lofts:

- 9 Specific fire resistance and airborne sound performances may be required, subject to local planning requirements (for example, in the vicinity of an airport flightpath).
- 10 There are no fire resistance or airborne sound performance requirements for the lining into the loft space. Specific fire resistance and airborne sound performances may be required for the entire roof construction, subject to local planning requirements (for example, in the vicinity of an airport flightpath).

Lofts

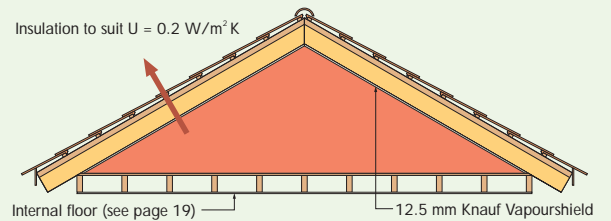
In a warm roof situation, the required U-value (and any required fire or acoustic performance) applies to the pitched roof element itself, and does not include the loft floor. The loft floor itself is treated as an internal floor and should be specified as such (see page 19).

In a cold roof situation, the required U-value applies to the entire construction above the upper floor level.

Warm roof solution

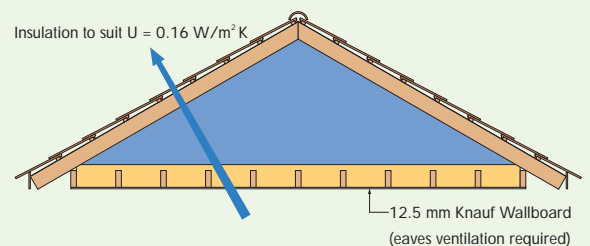
New build:

- Line internal surface of standard construction pitched roof with 1 layer 12.5 mm Knauf Vapourshield, fixed to rafters. Specify insulation to suit U-value.
- Fire resistance (minutes) N / A ⁹
- Airborne sound (dB Rw) N / A ⁹
- 0.2 W / m²K U-value (0.3 W / m²K U-value if a conversion)

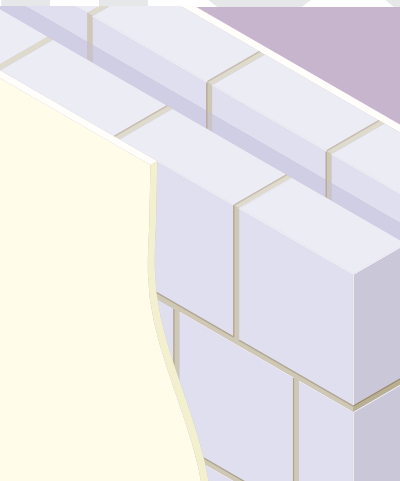


Cold roof solution

- Standard roof construction with eaves ventilation and insulation between joists: Line underside of timber joists with one layer of 12.5 mm Knauf Wallboard. Specify insulation to suit U-value.
- Fire resistance (minutes) N / A ¹⁰
- Airborne sound (dB Rw) N / A ¹⁰
- 0.16 W / m²K U-value



HOUSING



KNAUF DRYWALL SOLUTIONS: MASONRY

(For Metal and timber solutions, see page 18)

Separating walls

These systems all comply with Robust Details Ltd for Part E of the Building Regulations. Pre-Completion Testing is still required for Robust Detail solutions unless the site is registered with Robust Details Ltd. All systems have a maximum 3000mm height.

Solution 1 (E-WM-2)¹

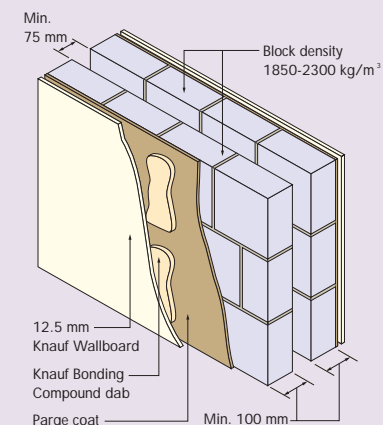
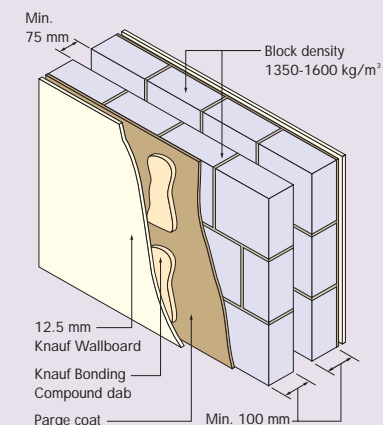
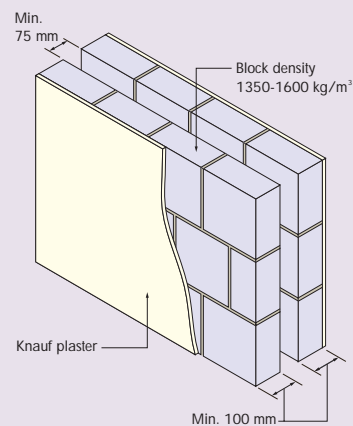
- Cavity wall, block density 1350-1600 kg/m³, each leaf thickness to be a minimum 100 mm, with minimum 75 mm cavity between leaves.
- Minimum 13 mm Knauf plaster finish applied to both room face sides
- 60 minutes fire resistance
- 45 DnT, w + Ctr dB airborne sound on-site²

Solution 2 (E-WM-4)¹

- Cavity wall, block density 1350-1600 kg/m³, each leaf thickness to be a minimum 100 mm, with minimum 75 mm cavity between leaves.
- Nominal 8mm (minimum 6 mm) parge render coat, scratch finished, applied to both room face sides.
- 12.5 mm Knauf Wallboard dot and dabbed to both room face sides using Knauf Bonding Compound.
- 60 minutes fire resistance
- 45 DnT, w + Ctr dB airborne sound on-site²

Solution 3 (E-WM-3)¹

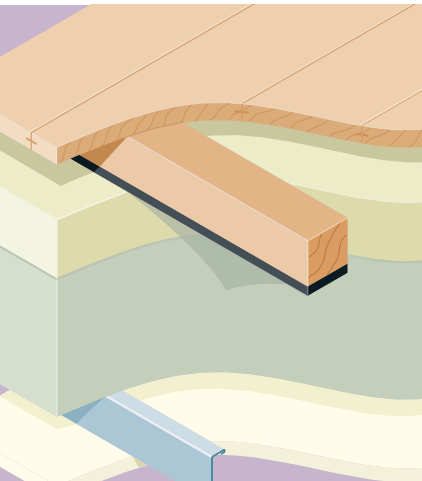
- Cavity wall, block density 1850-2300 kg/m³, each leaf thickness to be a minimum 100 mm, with minimum 75 mm cavity between leaves.
- Nominal 8 mm (minimum 6 mm) parge render coat, scratch finished, applied to both room face sides.
- 12.5 mm Knauf Wallboard dot and dabbed to both room face sides using Knauf Bonding Compound.
- 60 minutes fire resistance
- 45 DnT, w + Ctr dB airborne sound on-site²



Notes to Separating Walls:

1 For further information on the specification of Robust Details, refer to Knauf Drywall Technical Services.

2 Airborne sound on-site figures are the Building Regulations' minimum requirements as tested on-site. Each of these solutions has the potential to significantly exceed this figure when correctly installed.



Notes to Separating Floors:

- 3 For further information on the specification of Robust Details, refer to Knauf Drywall Technical Services.
- 4 Airborne and impact sound on-site figures are the Building Regulations' minimum requirements as tested on-site. Each of these solutions has the potential to significantly exceed this figure when correctly installed.

Separating floors

These systems all comply with Robust Details Ltd for Part E of the Building Regulations. Pre-Completion Testing is still required for Robust Detail solutions unless the site is registered with Robust Details Ltd.

Solution 1 (E-FC-1)³

Floating floor treatment:

- 18-22 mm flooring board over resilient composite deep battens sized to give 70 mm minimum void when loaded, or other treatment specified in RSD.

Masonry floor:

- 65 mm sand and cement screed or 40 mm proprietary screed (80 kg/m²) directly bonded to minimum 150 mm precast concrete floor slab (min 300 kg/m²).

Suspended ceiling:

- Knauf Suspended Ceiling system with minimum 75 mm void, one layer 15 mm Knauf Wallboard.
- 60 minutes fire resistance
- 45 DnT, w + Ctr dB airborne sound on-site⁴
- 62 L'nT, w dB impact sound on-site⁴

Solution 2 (E-FC-2)³

Floating floor treatment:

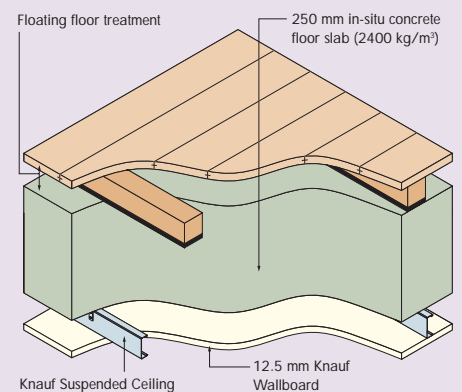
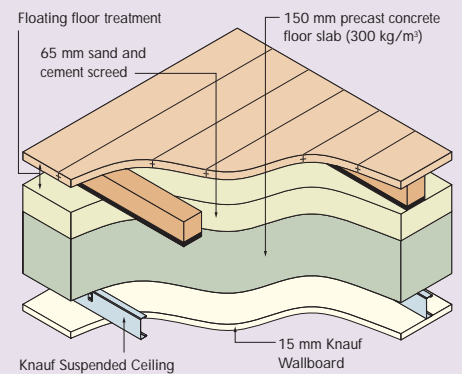
- 18-22 mm flooring board over resilient composite deep battens sized to give 70 mm minimum void when loaded, or other treatment specified in RSD.

Masonry floor:

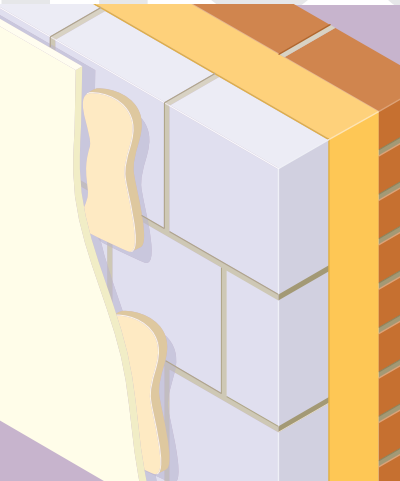
- Minimum 250 mm in-situ concrete floor slab, minimum density 2400 kg/m³.

Suspended ceiling:

- Knauf Suspended Ceiling system with minimum 75 mm void, one layer 12.5 mm Knauf Wallboard.
- 60 minutes fire resistance
- 45 DnT, w + Ctr dB airborne sound on-site⁴
- 62 L'nT, w dB impact sound on-site⁴



HOUSING



Notes to External walls:

- 5 The use of a fully filled cavity wall may not be permitted in areas of the country that are subject to high levels of wind-driven rain. Knauf Drywall manufactures a range of insulating laminate plasterboards that can be applied as the inner lining of the wall.
- 6 Ground storey loadbearing wall, height of top floor above ground not more than 18 m.
- 7 Specific airborne sound performance may be required, subject to local planning requirements.

External walls

Either Knauf plasterboard on dabs, or Knauf plaster can be specified to provide the decorative internal finish to a masonry external wall. Unlike masonry separating walls, there is no requirement for the use of an additional parge coat if applying a plasterboard finish on dabs.

Solution 1

Internal lining with plasterboard on dabs:

- Masonry cavity wall, brick outer leaf, aerated block inner leaf, with fully filled cavity⁵. Insulation and block specified to suit U-value and fire rating.

Inner lining:

- 1 layer of Knauf Wallboard adhered to blocks with Knauf Bonding Compound dabs.
- 60 minutes fire resistance⁶
- Airborne sound (dB Rw) N / A⁷
- 0.35 W / m²K U-value (0.3 Scotland)

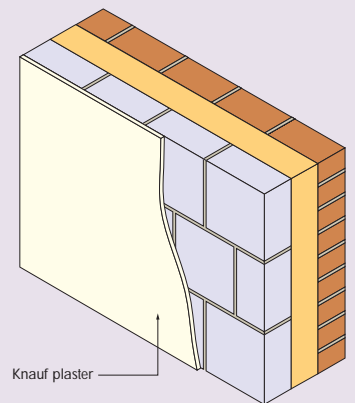
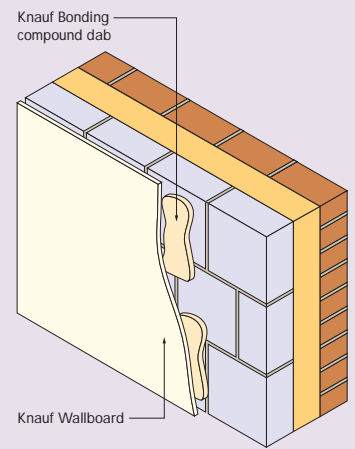
Solution 2

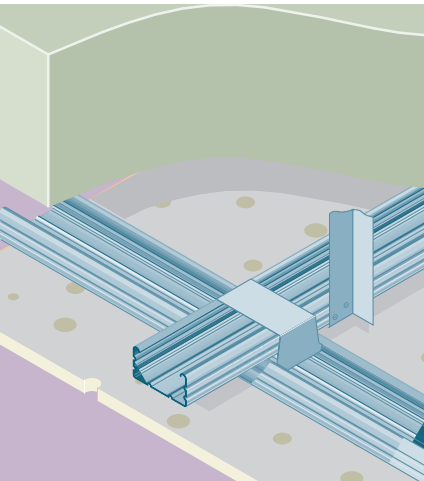
Internal plaster finish:

- Masonry cavity wall, brick outer leaf, aerated block inner leaf, with fully filled cavity⁵. Insulation and block specified to suit U-value and fire rating.

Inner lining:

- Minimum 13 mm thick Knauf MP75 plaster.
- 60 minutes fire resistance⁶
- Airborne sound (dB Rw) N / A⁷
- 0.35 W / m²K U-value (0.3 Scotland)





Note to Open spaces:

8 Knauf Apertura can be specified in a number of different styles and with different void depths, all of which will affect the sound absorptive performance and hence the absorptive material class of the system.

Contact Knauf Technical Services on 01795 416259 for help in specifying the Apertura system.

Open spaces

The following advice is based on Method A of part E3 of the Building Regulations (also see page 15).

Entrance halls, corridors or hallways solution

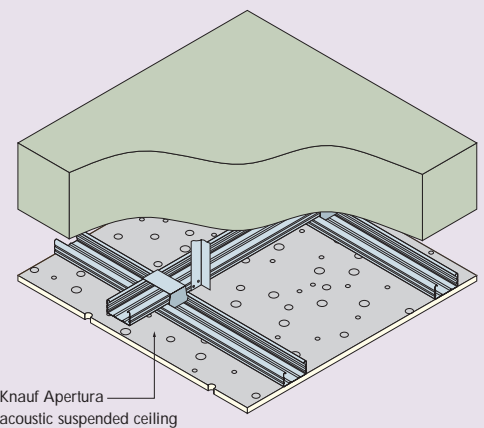
- Specify a suitable^B Knauf Apertura acoustic suspended ceiling to line the required ceiling area (equal or greater to the floor area).
- Absorptive material (BS EN ISO 11654:1997) Class C

Stairwells and stair enclosures solution 1

- Specify a suitable^B Knauf Apertura acoustic suspended ceiling to line 50% of the measured ceiling area (this being at least equal to the combined area of stair treads, upper surfaces of intermediate landings, upper surfaces of landings except ground floor, and ceiling area of top floor).
- Absorptive material (BS EN ISO 11654:1997) Class C

Stairwells and stair enclosures solution 2

- Specify a suitable^B Knauf Apertura acoustic suspended ceiling to line the measured ceiling area (this being at least equal to the combined area of stair treads, upper surfaces of intermediate landings, upper surfaces of landings except ground floor, and ceiling area of top floor).
- Absorptive material (BS EN ISO 11654:1997) Class D



Finishing masonry walls using projection plastering

Projection plastering is the process of applying plaster via machine. Projection plaster is machine-sprayed onto interior structure elements and then simply floated by hand.

Projection plaster is an outstandingly efficient and cost effective method demanding less labour and generally less waste than hand applied plaster.

Knauf's MP75 is widely used across Europe and is a one-coat plaster, offering fast drying times, exceptional coverage and a highly durable finish.

For further information, contact Knauf Drywall Technical Services on 01795 416259.

Technical data

- Plaster thickness: 10 mm (min. 5 mm)
- Yield: 100 kg = 110 litres liquid mortar
- Drying time: approximately 7 days (depending on thickness, humidity, temperature and ventilation)
- Density: approximately 1100 kg / m³
- Thermal conductivity: 0.35 W / m²K

HOUSING

BEST PRACTICE DETAILING

Housing construction has specific detailing requirements.

Set out in this section are Knauf Drywall's Best Practice Solutions for the more common issues. A full range of standard design detailing can be found in the Knauf Drywall Manual at:

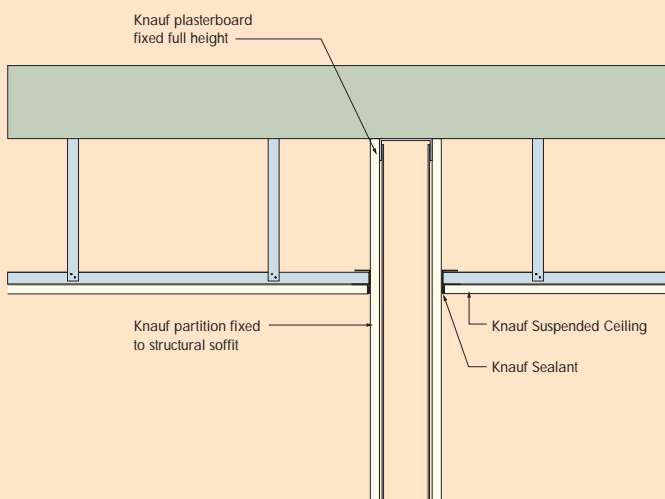
www.knaufdrywall.co.uk/themanual

For further advice, please contact Knauf Drywall Technical Services on 01795 416259.

FIRE AND ACOUSTIC

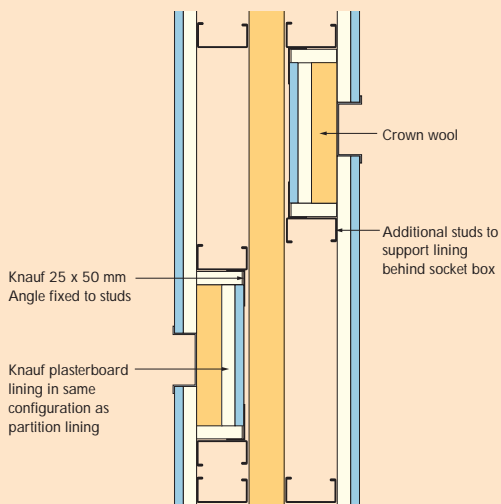
Partition interface with suspended ceiling

Partitions should be built between structural building elements in order to achieve their maximum height, fire and acoustic performance. The suspended ceiling can then be installed abutting the partition (the same principle applies with ceiling linings on resilient bars). This prevents issues with fire or sound bypassing the partition through the suspended ceiling cavity, as well as providing a stable fixing point.

**Switch boxes and sockets**

If the sockets are located in a separating wall, then the Knauf plasterboard lining behind the socket box must have a minimum mass of 22 kg/m^2 (as per the lining of the wall itself). Sockets on opposite sides of the wall must be staggered.

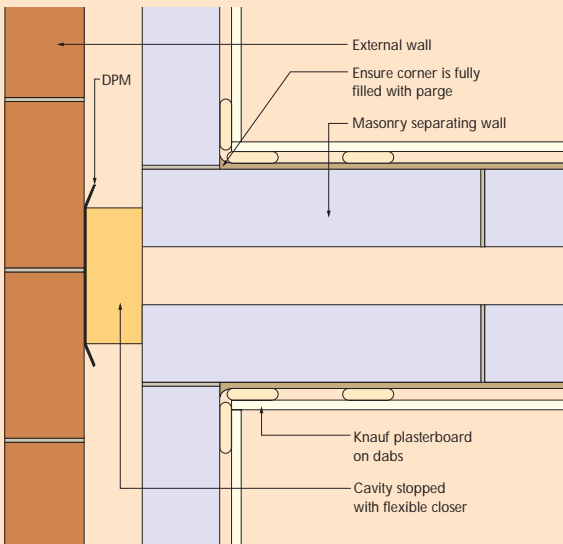
When kitchen units are mounted on the separating wall, an additional service void should be created using a Knauf plasterboard lining on battens.



Masonry external wall flanking detail

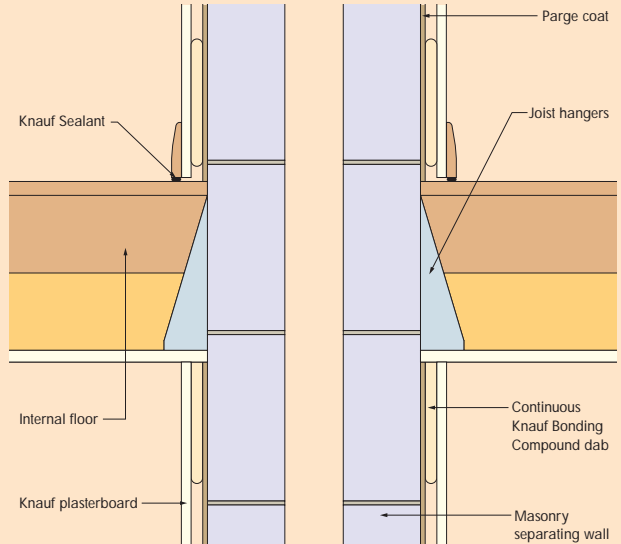
This detail is taken from the Government detailed Robust Details for Part E of the Building Regulations, and is designed to minimise the risk of sound bypassing the separating wall through the flanking wall.

The outer leaf of the external wall may be of any construction and the cavity may be either filled or partially insulated. The cavity should be stopped with a flexible closer unless the cavity is fully filled with mineral wool or expanded polystyrene bead. The separating wall may be either bonded or tied to the flanking wall (refer to Building Regulations Part A – Structure).



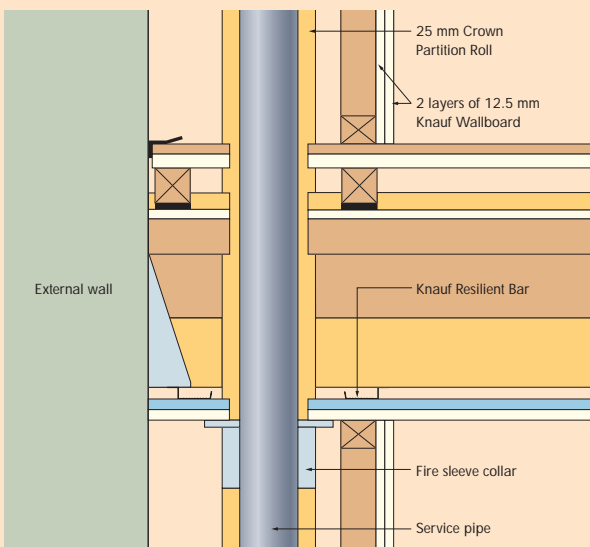
Internal timber floor junction with masonry separating wall

This detail is taken from the Government detailed Robust Details for Part E of the Building Regulations, and is designed to minimise the risk of sound bypassing the floor through the flanking wall. Care must be taken to ensure potential air paths are properly sealed.



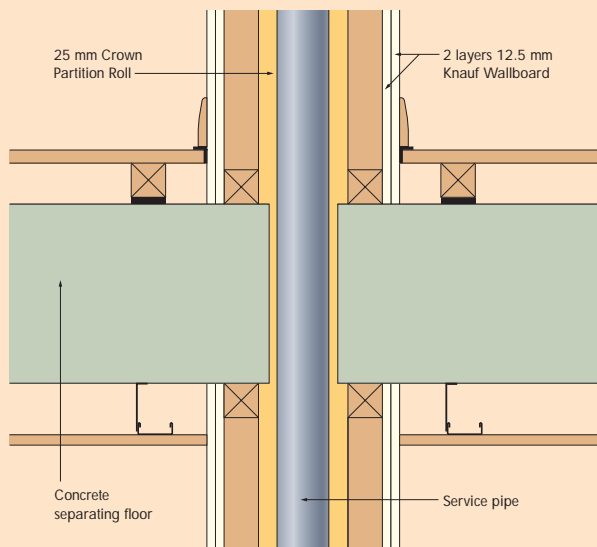
Penetrations – service pipe through timber separating floor

The service pipe should be boxed with a minimum of two layers of 12.5 mm Knauf Wallboard. A fire sleeve collar must be located at the ceiling pipe junction. The complete perimeter of the pipe must be covered with a minimum 25 mm mineral fibre quilt.



Penetrations – service pipe through masonry separating floor

The service pipe should be boxed with a minimum of two layers of 12.5 mm Knauf Wallboard. Ensure that all voids are sealed where the service pipe penetrates the separating floor. The complete perimeter of the pipe must be covered with a minimum 25 mm mineral fibre quilt.

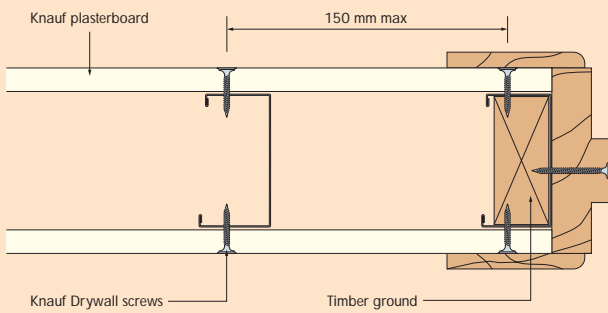


HOUSING

STRUCTURE

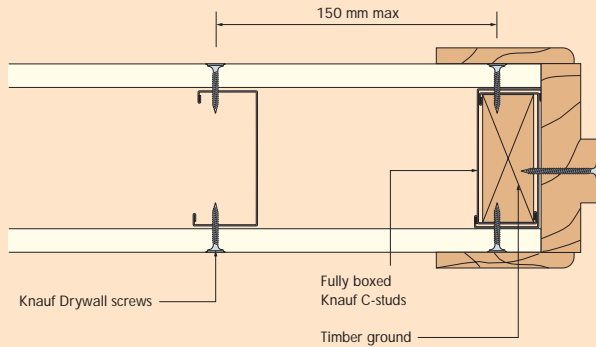
Jamb for light door

Suitable for doors weighing up to 25 kg.



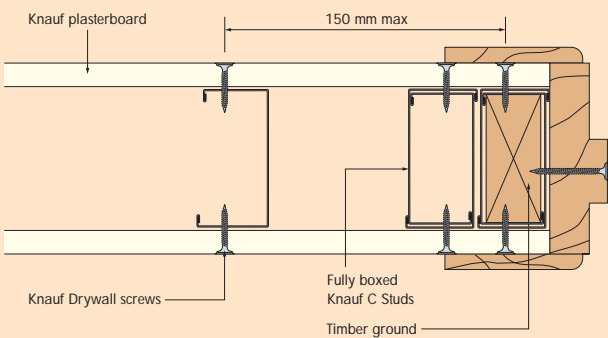
Jamb for medium weight door

Suitable for doors weighing up to 50 kg.



Jamb for heavy door

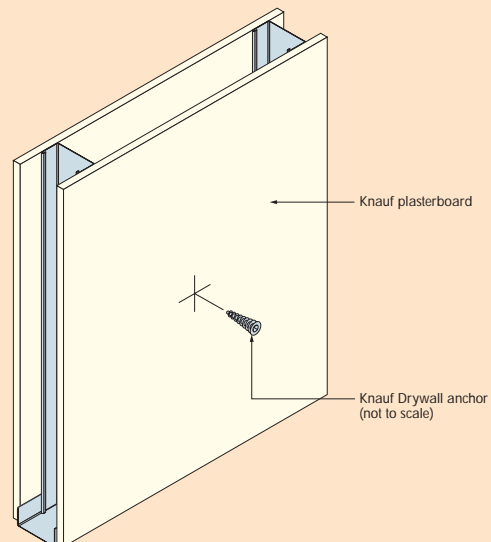
Suitable for doors weighing up to 75 kg.



Lightweight fixings parallel to surface

Suitable for lightweight fixings where the applied load is fixed and continuous, to a maximum of 20 kg.

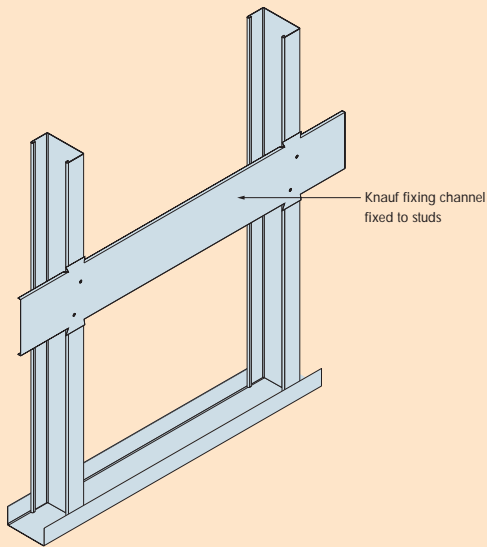
- Suggested applications: mirrors, pictures, light fixings, coat hooks.



Medium weight fixings parallel to surface

Suitable for medium weight fixings where the applied load is fixed and continuous, and for lightweight fixings where the load may be subject to some movement (e.g. through removable objects).

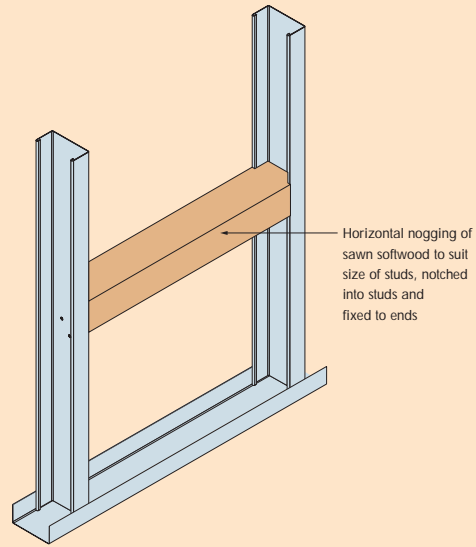
- Suggested applications: radiators, curtain rails.



Heavyweight fixings parallel to surface

Suitable for heavyweight fixings where the applied load is fixed and continuous, and for medium weight fixings where the load may be subject to some movement (eg. through removable objects), to a maximum of 40 kg/lin.m.

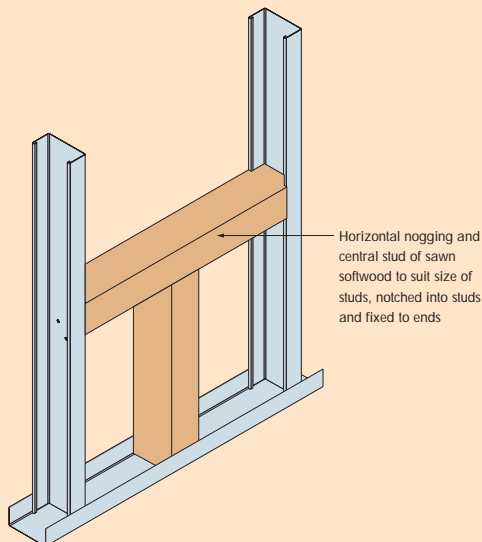
- Suggested applications: bath (lateral location only), cupboards, shelving, handrails.



Heavyweight fixings parallel to surface at low level

This is an alternative for use at low level where there may be a requirement for the partition to take a heavier than normal load to a maximum of 80 kg/lin. m.

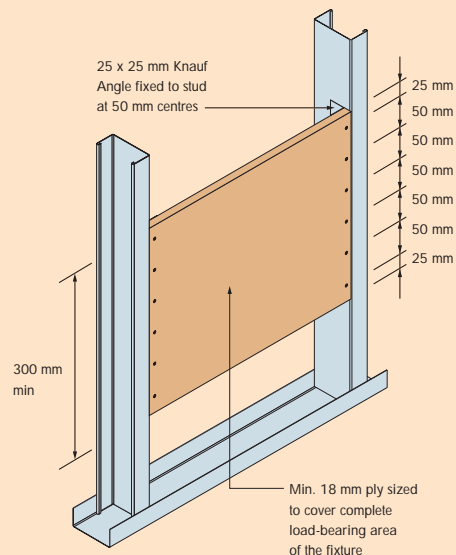
- Suggested applications: cupboards, basins, work surfaces.



Heavyweight fixings with moment

For use where the applied load is not directly adjacent to the board surface, thus producing a twisting force that the other fixing details are not capable of withstanding. It is also suitable for fixing items that are likely to receive rougher than usual treatment.

- Suggested applications: TV mounting arms, pay telephones and hoods, disabled grab rails.



HOUSING



Standerwick Orchard

Knauf Drywall systems were specified on this project to provide a contemporary interior within a traditional thatched home. The use of Knauf Drywall materials provided a lightweight partition offering excellence in terms of acoustic, thermal and impact performance. The Knauf Drywall system was specified in place of more traditional finishes due to significant savings in build time.

Address	Goose Lane, Broadway, Ilminster, Somerset TA19 9RU
Developer	George Wimpey Bristol
Designer / Architect	George Wimpey Bristol (in-house)
Drylining	MJ Stevens, Exeter
Project value	£9m
Project details	34 houses: A mix of 2, 3 & 4 bed thatched developments
Knauf products used	<ul style="list-style-type: none"> • Knauf 50 mm C Stud • Knauf 52 mm U Channel • Knauf Standard Wallboard 2400 x 1200 x 12.5 TE • Knauf Joint Filler • Knauf Joint Cement Super Smooth





Canada Fields

Knauf Drywall systems have been installed throughout this prestige development of properties ranging from single bed apartments to four bedroom houses.

Not only do Knauf Drywall systems meet the very high aesthetic criteria required for the decorative finish, but the use of performance-specific boards have allowed the construction to meet the various Building

Regulations governing fire, thermal and acoustic requirements. Furthermore, the precision of metal stud and MF Ceiling systems minimises waste, whilst maximising accuracy and speed of installation.

Address	Vancouver Road, Turnford, Herts EN10 6FB
Developer	Rialto
Designer / Architect	Rialto / GHM
Drylining	RPN, St Albans
Project value	£31m
Project details	479 plots: 1 & 2 bed apartments, 3 & 4 bed houses
Knauf products used	<ul style="list-style-type: none"> • Knauf 50 mm C Stud • Knauf 52 mm U Channel • Knauf MF Ceiling System • Knauf Standard Wallboard 2400 x 1200 x 12.5 / 15 TE • Knauf Moistureshield 2400 x 1200 x 12.5 TE • Knauf Fireshield 2400 x 1200 x 15 TE • Knauf Bonding Compound • Knauf Joint Filler • Knauf Joint Cement Super Smooth



Further information is contained within The Complete Drywall Manual, available online at our award winning website: www.knaufdrywall.co.uk/themanual together with a range of interactive tools to aid the specifier and contractor.

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