BRITISH BLIND & SHUTTER ASSOCIATION

Training Guide

Fixings Module

This module covers:-

Screws

Drills

Fixing into wood

Fixing into plastic

Fixing into metal

Fixing into brick / concrete

Fixing into plasterboard

Fixing into suspended ceilings

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1.0 Intro

A correctly fitted product generally works better, looks better and is safer for the user.

There are so many different ways of fixing that the choice can become quite overwhelming for a beginner. This module is a basic introduction to fixings indicating:

- what is commonly used;
- when it is used;
- how it is used; and
- what other options may be available.

NOTE

You must check the grounds you are drilling into to identify any hidden services such as pipes or cables. There are hand-held devices available to help you detect hidden services.

You must also check that asbestos is not present or likely to be present.

You must always wear the appropriate Personal Protective Equipment (PPE) depending on the work you are undertaking.

TIP 1

For fixings such as masonry bolts and sleeved anchors but also more common wall plugs many manufacturers have performance data showing maximum weights and forces. These should always be consulted.

TIP 2

Fischer hold free training seminars on different fixing types throughout the year - contact technical@fischer.co.uk

2.0 Screws

Let's start at the beginning.

Screws are most commonly used in almost every type of fixing that we will be addressing in this module.

There are five basic characteristics of a screw.

2.1 Material

The most popular material is steel often coated with nickel plate (NP) or zinc plate (ZP) as these are ideal for most installations.

If you are fixing in a high moisture environment such as in a bathroom or externally, ordinarily you should use a screw made from stainless steel as steel could corrode. Although these are a little more expensive, they are much more corrosion resistant.

2.2 Head

The head of the screw is the part used to drive the screw into the material or the fixing. There are many styles of heads, but the three most common are:

Screw drive types

Slot head. This requires a flat bladed screwdriver. These are not commonly used as they are not as easy to use with a powered tool.

Cross head. Often called Phillips or Pozi-drives, these are the most common screw heads used in our industry. The screws are driven by a cross-headed screwdriver, and its design keeps the screwdriver located in the middle of the screw head making it easier to drive.

Bolt head. These screws tend to be larger and are designed to hold heavy loads. These screws are tightened using a spanner, a socket or a special impact driver.

2.3 Thread and Gauge

The gauge of the screw is how thick the shaft is. The thicker the screw, the heavier load it can support and the higher the identifying number of the screw with imperial measurements. With metric sizes the actual diameter is stated and a comparison is shown in the table below.

Metric		Imperial equivalent	
Diameter	Length (mm)	Gauge	Length (in)
3.0	12	4	1/2
3.0	20	4	3/4
3.0	25	4	1/2
3.5	12	6	1/2
3.5	16	6	5/8
3.5	20	6	3/4
3.5	25	6	1/2
3.5	30	6	1 1/4
4.0	20	8	3/4
4.0	25	8	1
4.0	30	8	1 1/4
4.0	40	8	1 1/2
4.0	45	8	1 3/4
4.0	50	8	2
4.0	60	8	2 1/2
4.0	70	8	2 3/4
5.0	30	10	1 1/4
5.0	40	10	1 1/2
5.0	50	10	2
5.0	60	10	2 1/2
5.0	70	10	2 3/4
5.0	80	10	3
5.0	90	10	3 1/2
5.0	100	10	4
6.0	50	12	2
6.0	60	12	2 1/2
6.0	70	12	2 3/4
6.0	80	12	3
6.0	90	12	3 1/2
6.0	100	12	4

The thread consists of the grooves that appear to run around the screw and these are designed for different jobs. A wood screw has a design of thread that cuts into the wood. A self-tapping screw is designed to cut into metal. A set screw has a thread designed for use with a matching nut. You need to use a thread that best suits the material you are fixing to.

2.4 Length

This is the length of the screw measured from one end to another. On counter sunk this means from top of head to tip, on pan heads or round heads from the underside of the head to tip.

2.5 Style of the screw head

There are two main designs of screw head – pan head and countersunk.

Pan head is ideal for fixing blind and curtain brackets as the flat underside of the screw head clamps brackets very well. In addition, countersunk can damage the bracket (see picture opposite).

Where possible use pan head design, but switch to countersunk if the pan head available is too small.

TIP

When using any screws, use a screwdriver / bit that is of an ideal size and design to match the screw. Using the correct sized driver / bit will reduce the risk of damaging the screw head or slipping off the screw and damaging the fixing area.

An example of this is cross head screws. These are screws with a cross shape head design called PH and PZ, both having a cross shape on the top of the screw which to the untrained eye looks the same. But in practice a PH screw driver bit will not drive a PZ screw very well. Look at the screw box for guidance as to what screwdriver to use.

TIP

Use the clutch on your drill and a low speed when driving screws.

Use a hand screwdriver when there is any concern with the fixing grounds, for example a drill driver may often spin the wall plug in soft grounds whereas a hand driver control will allow the plug to bite.

Lastly, make sure that the screw you have picked will go through the hole in the bracket and that the head of the screw is not too small allowing it to fall through the hole of the bracket.

3.0 Drills Bits

When drilling walls or ceilings you may not be aware of what the material is constructed from and what is behind the surface you are drilling to. Precautions ought to be taken to reduce risks. For example, if on a commercial / business site, always check the Asbestos Register to ensure that you are not drilling in an area known to have the asbestos present (refer to your asbestos awareness training for more details).

Warning – Asbestos was used in textured wall coatings in homes up to the 1980s.

Also be aware of where wiring or water pipes may run. Never drill directly above or below a plug socket or light switch. To confirm you are safe to drill, use a wire / pipe detector before you carry out any work.

You should always wear Personal Protective Equipment (PPE) when drilling. This should be safety goggles / glasses for all types of drills, and an appropriate dust mask when drilling brick, concrete, plasterboard and tiles.

Also remember to protect the area around you with sheeting. Drilling brick, concrete and plasterboard will cause a lot of dust whereas wood, metal and plastic will produce sharp shards of debris which can be dangerous if trodden on or handled by customers or children and pets.

TIP

Use a dust cup or vacuum extraction system to help control dust.

In the blind industry we are requested to fix to many surfaces. This almost always involves drilling and the correct drill bit helps ensure that your fixing fits correctly and that the surface is drilled efficiently and neatly.

This is only a basic guide but the most common materials you are likely to encounter are:

3.1 Wood

A wood drill bit is designed not only to cut into the wood but also to drag the wood debris out of the hole so the drill can continue to work. Different sized drill bits require different speeds so consult the guide on the packaging for advice. If you drill wood too quickly, the debris can bind to the drill bit stopping it from cutting and the wood can start to burn in the hole.

3.2 Metal

A metal drill bit is usually called an HSS drill bit (High Speed Steel). These tend to be used at a higher speed (again refer to packaging) and although they are primarily designed for steel, they can be used for aluminum too.

On very small sizes, say 2-3mm, HSS bits can also be used for small pilot holes in wood.

3.3 Brick, Concrete and Plasterboard

These are called masonry bits and they work in a different way to wood and HSS bits. Instead of cutting, they are used with a hammer action on a drill which impacts the surface causing it to break into dust. The turning motion of the drill bit then brings the dust out of the hole allowing the drilling to progress.

The hammer action can vary, with a small drill being quite gentle and ideal for softer surfaces such as plaster. There are more powerful drills which use a drill bit called an SDS (Slot Dimple Slot). These hammer much harder and are best for drilling hard brick and concrete.

3.4 Tiles

Tile drill bits are specially designed for drilling glazed and non-glazed wall tiles. The spear design cuts through the tile at a slower speed opening up the hole gently to avoid cracking the tile.

There has been a recent trend for floor tiles to be used on walls. These are very tough to drill into because they are cast in such a way to allow them to be weight bearing. A special drill bit, often with a diamond cutting head, should be used here as standard tile bits will simply be ineffective.

TIP

It is a good idea to use masking tape over where you intend to drill as this helps to stop the tip of the bit slipping.

3.5 Plastic

Plastic is best drilled using HSS bits. They drill plastic very cleanly and also work well with metal often found inside or behind plastic extrusions that are added for strength.

4.0 Fixings

Generally you will be fixing into one of five materials when fitting blinds. Below is a beginners' guide as to which fixings are the most appropriate, a brief overview of how to use them and other considerations.

4.1 Fixing to Wood

Generally wood is a good surface to fix blinds to. Window frames are often wooden and sometimes wooden battens may have been installed for you to fix to. Wood can be found in older houses over windows as a lintel.

Wood screws are often the straight forward choice however there are a number of problems you will want to avoid.

Avoid splitting wood

If you are fixing to wooden battens in particular, you can split the wood if you are drilling close to the edge or using a thick gauge screw. This can be avoided by drilling or 'piloting' a smaller hole first to give the larger screw a hole to locate into without splitting the timber. The screw packaging should guide you as to what size hole to drill.

This is especially important when using coach screws which are very thick screws with bolt heads used primarily for fixing awnings to beams. Without piloting a hole, these fixings might be impossible to get started.

Use an appropriate size and length of screw

Screw size and length needs to be appropriate for the product being fixed. Smaller screws may be suitable for a small aluminum Venetian blind but larger, thicker gauge screws will be needed for a heavy product such as a large wooden Venetian blind. Larger coach screws would be needed for an awning.

However, there is no point in having a screw protruding from the back of a batten of wood as it serves no purpose and could become a hazard - so bigger is not always better.

TIP

It is best practice to carry a selection of screws in terms of both length and gauge so you are prepared for all types of different situations.

Check that the wood you are fitting to is strong enough to hold the product

If you are fitting to battens that you did not install, you need to check that they are strongly fixed and suitable for the product you are proposing to fit to them. Your fixing into the batten may be very good, but if the batten is badly fitted to the wall, it could still result in the blind falling and damaging the product, the surroundings and possibly a person.

4.2 Fixing to Plastic

In general you will be fixing into plastic when attaching blinds to modern window frames and conservatories.

Often there will be aluminum inside or behind plastic which can be a very secure material to fix blinds into.

There are two main methods of fixing into plastic.

Pilot drill and self tapping screw

The first is to pilot drill a small hole using an HSS drill bit and then use a self-tapping screw to securely fix into the aluminum behind the plastic making a very secure fixing.

Self-cutting screw

This type of screw has in effect an HSS drill bit built onto its tip, and it drills a pilot hole as you screw. This can significantly reduce the installation time if you have a lot of screws to install but you need a little more clearance space behind the plastic to use these.

Just as with wood you need to ensure that the plastic to which you are fixing to is itself fixed strongly enough to bear the weight of the blinds you are installing. Be cautious as there are many pieces of plastic used in conservatories as trim pieces rather than structural components. Some are stuck into place using double sided tape, some glued in using silicon sealant and some just clipped into place. Obviously none of these are suitable for bearing the weight of a blind and you should either find somewhere else to fix to or use a longer screw to fix to a more substantial material behind the plastic if this is appropriate.

4.2.1 Fixing to Conservatory Roofs

As plastic windows are never painted some customers do not like you to drill them as they worry that there will be holes in the window frames if they ever change the blinds. Also some conservatory companies have been known to advise customers that their warranties will be void if holes are drilled into the frames. At the survey stage a written approval should have been obtained from the customer regarding any fixings into windows and conservatories.

Very often the plastic that you see on conservatory roof beams are trim covers that are concealing aluminum support beams designed to take the weight of the roof. Fixing roof blinds to the plastic alone will not be suitable as the weight of the blind can pull the trim away from the beam. Instead you need to drill through the plastic and into the aluminum but take extra care. Often the roof is made from glass and drill bits or screws that are too long can crack or shatter the glass. Remember glass also expands in the summer and so the sharp tip of a screw may become too close to glass and when this expands in the summer, it may cause it to break.

Here you must drill carefully and select a screw that is short enough not to make contact with the glass. This is a situation where the self-cutting screw is not usually recommended.

4.3 Fixing to Metal

Metal often offers a very secure fixing for window blinds and is found in aluminum window frames, box lintels and rolled steel joists (RSJ).

Aluminum window frames can be fixed to in the same way as plastic window frames by either pilot drilling and using appropriate self-tapping or self-cutting screws.

Cavity Wall

External Solid Wall Construction

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Box lintels are slightly different as they are hidden behind plaster in a window reveal. These box lintels are a folded metal box (see pictures above). These are normally around 2-3mm thick and can be drilled using an HSS drill bit. An appropriate self-tapping screw can be driven in to provide a very secure fixing for most window blinds.

Rolled Steel Joists (RSJs) are often called 'I' beams, and are used to support large openings in supporting walls or are commonly found above large bi-fold doors. These are very difficult to fix into. You will need to drill using an HSS drill bit and a self-tapping screw. The drill bit needs to be the specific size that matches the screw. You need to follow the instructions given on your screw packaging and possibly consult an engineering tap guide to identify what drill size to use.

Another way of fixing through an exposed structural metal beam is to drill through it and use nuts and bolts to fix the product. This is often used for fixing external products like awnings to balconies or other structures.

You need to double check that the structure you are proposing fixing to will uphold the additional stresses that your products will apply to it and will not affect its structural integrity. This should have been identified at a survey stage especially with large / heavy products such as awnings that not only add extra weight but also add extra stress during windy conditions.

If you are drilling a metal external surface, you need to protect the metal after drilling with some form of paint or other treatment to prevent rust from forming on the newly exposed surface. Nuts and bolts should be of a suitable gauge for the product they are holding and either Nyloc nuts or anti-shake washers used to ensure that the fixing stays tight.

The biggest issue with drilling metal is the swarf that is produced as you drill. These metal shavings can be very sharp and could cause blindness if you get them in your eyes so eye protection must be worn at all times. Work areas must be protected with sheeting because swarf from the floor can be trodden on by people and pets.

Also smaller drill bits can snap and splinter. During drilling, eye protection is a must.

TIP

You can blunt an HSS drill bit very easily if you drill masonry or plaster. So if you are drilling a metal lintel that is behind plasterboard, use an old blunt bit to drill the plasterboard first and keep your newer bit sharp for later when drilling the metal it is intended for.

4.4 Fixing into Brick and Concrete

When fixing to brick and concrete, a combination of a fixing and a screw is used (although there are exceptions).

Generally you cannot screw into brick or concrete directly. First you need to drill a hole and insert a fixing. There are a number of fixings that offer different degrees of strength and suitability for different products and situations.

- **Wall Plugs**

Wall plugs are the most commonly used form of fixing when fitting to bricks or concrete.

A wall plug fits into a hole that you have drilled into a wall. The hole must be the right size for the plug with the plug being a snug fit. A screw (the size of which is dictated by the packaging of the wall plug) is then screwed into the plug causing the plug to expand inside the hole providing a secure fixing.

Wall plugs are typically available in a range of sizes from 5mm through to 14mm, with the smallest sizes only suitable for small blinds and the largest suitable for coach bolts for fixing awnings.

However for a wall plug to work correctly, the screw being inserted must be long enough to travel the whole way through the plug to expand it correctly. Also where you can see the brickwork, it is best to drill into the middle of the brick for maximum strength and to avoid drilling into the mortar lines as these are not as strong and can crumble.

TIP

If using wall plugs through plaster, use a non-collared version and push it deeper into the brick for a more secure fixing. If you are using wall plugs with tiles, make sure that you push the plug through the tile and into the wall so that the screw does not expand the plug in the tile hole and does not cause it to crack.

- **Shielded Anchor Bolts**

Shielded anchor bolts work in a similar way to wall plugs in that you drill a hole and insert the fixing. Then as you tighten the bolt a metal threaded wedge draws through the fixing forcing the metal sides of the fixing into the substrate.

These fixings are ideal for concrete but can split bricks if overtightened.

- **Sleeve Anchor Bolts**

Sleeve anchor bolts put less strain on the substrate and can hold the same loads as shielded anchor bolts.

TIP

Tighten your shielded anchors up before fixing to locate the anchor in the hole to make it easier to locate the bolt part without losing the anchor into the wall cavity.

- **Masonry Bolts**

Masonry bolts, also known as frame fixing screws, are specially threaded bolts that can be wound into a good quality brick without the need for a shield or wall plug. There are two advantages to this fixing over wall plugs and shielded anchors:

Firstly the hole required is often much smaller and you can sometimes drill through a fixing bracket rather than having to remove it and risk mis-aligning.

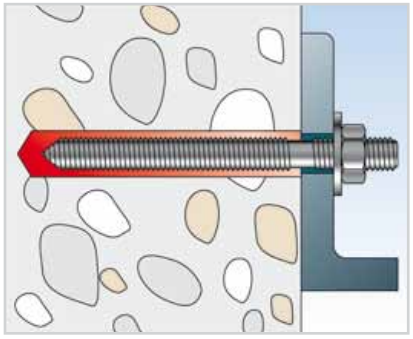
This product does not expand so there is much smaller chance of cracking a brick (especially an end brick).

However if you are using this product, you must be confident that the brick you are fixing to is suitable and that you avoid cavity bricks because if you fix into a hollow space, you will reduce the strength of the fixing as there is less material for the thread to bite into.

TIP

If you are fitting through plaster / cladding to a solid surface, you would need to use steel spacers behind your bracket. Although it may feel solid when fitted, but the pressure of wind on the awning can over time crush the softer outer surface. This is also true with some retro-fitted external wall insulation.

- **Chemical (Resin) fix**



As the name suggests this fixing method uses chemical, most often resins, to achieve a fixing. Resin is mixed in the nozzle and then injected into a fixing hole where it hardens and secures the fixing into place.

Chemical fixing can be used internally for fixing wall plugs offering additional fixing strength in particular in oversized drill holes.

Externally chemical fixing is used mainly for awnings. Here holes are drilled and cleaned, the resin injected and metal studs pushed into the uncured resin bonded into place. Once the resin has hardened, the studs are then used to fix the awning brackets in place.

Chemical fixing is simple to use but may require skill and practice. The resin must be handled carefully and as always, suitable PPE should be worn as guided by the manufacturer's instructions. If fixing into a substrate where you are entering a cavity such as bricks with holes in the middle, you may need to add a sleeve into the hole to help the resin stay in place and not fall into the void. Also curing time is affected by temperature so the resin may be ready in minutes during the summer but it may be hours before it is cured in the winter. Be aware that different resins have different curing characteristics, depending on the temperature, and a suitable choice should be considered.

NOTE

Drill holes should be cleaned in accordance with the manufacturer's instructions and a site vacuum may prove useful.

4.5 Fixing into Plasterboard

In essence plasterboard is a large sheet of plaster that is pre-formed for easy transportation and installation. It is a wall covering, not a load bearing material.

Often it is used on walls, and if you can drill through it and fix to a structure behind, you can achieve a high strength fit. However what if there is a void behind it such as in a ceiling?

Remember that regardless of how good your fixing to the plasterboard is, it is only as good as the fixing of the plasterboard to its structure. Plasterboard is normally screwed into place, and there is no point trying to fix an extremely heavy product like a large wooden Venetian blind into plasterboard alone as it could pull the plasterboard from its fixings.

As such you need to be confident over what you are fixing to or find an alternative way of installing your product. You can use:

- **Battens and joists**

The best way to fix to plasterboard is not to fix to it at all. If you can locate any ceiling joists or wall battens, you can screw through the plasterboard and into these for a very secure fixing.

TIP

An electronic joist finder can help here to locate joists, and these devices often double as a wire and pipe finder.

- **Wall Plugs**

There are specifically designed plastic wall plugs especially for plasterboard. These plugs have a collar to stop them pushing through the board, and legs that open up behind the board. As they are plastic, they are not a high strength solution and should be used for lighter blinds.

TIP

If using these fixings, increase the number of brackets used and spread the load by using two brackets at the control ends for extra strength.

- **Self-drill fixing**

These fixings are available in both metal and plastic and have a built-in drill tip. This drills the plasterboard and the deep thread of the fixing bites into the board and fixes to it. Care should be taken when using powered screwdrivers.

These fixings are medium strength and very quick to install. However you do need to take care because if the plasterboard is not in good condition this fixing cannot take correctly and if you hit an obstruction behind the board which stops the fixing sinking into the board the thread can damage the plasterboard.

- **Spring toggle fixing**

A spring toggle fixing is in principle similar to an umbrella where you close the fixing to push it through a pre-drilled hole and it opens behind the board and can then be tightened up.

This is a good quality, high strength plasterboard fixing. However you cannot remove the bolt from the fixing because you lose the toggle behind the board.

- **Plasterboard metal anchors**

This is an excellent plasterboard fixing offering relatively high strength and the ability to reuse the fixing again without compromising the strength.

To use this fixing you drill a hole of the size specified on the fixing packaging. The fixing is then pushed into the hole to its collar and a setting tool is then used to open the fixing behind the board and clamp a metal thread into the board. A screw that is provided with the fixing is then used to mount the blind brackets.

Because the thread is clamped into the board, brackets can be easily removed and refitted.

4.6 Fitting to a Suspended Ceiling

A suspended ceiling fix is a fairly common request in commercial situations. There are a number of methods of attaching blinds to a suspended ceiling but as with plasterboard, you must check that the ceiling you are fitting to is strong enough to bear the weight of the blinds.

- **Fixing to the ceiling grid**

You can fix blinds to the ceiling grid of a suspended ceiling, but this is not ideal. This is not ideal as this is made of lightweight steel and is not suitable for screwing to. A better solution is to rivet brackets to the grid but this should only be used for very lightweight blinds.

Vertical blinds can be fixed to suspended ceilings using a special bracket available from some manufacturers.

- **Ceiling pattresses**

A ceiling pattress is a piece of wood (normally plywood) that is cut to the same size as the ceiling tiles. This is then placed behind the ceiling tile inside the ceiling grid and the brackets can then be fixed through the tile and into the wood / plywood.

- **Fixing through to main ceiling**

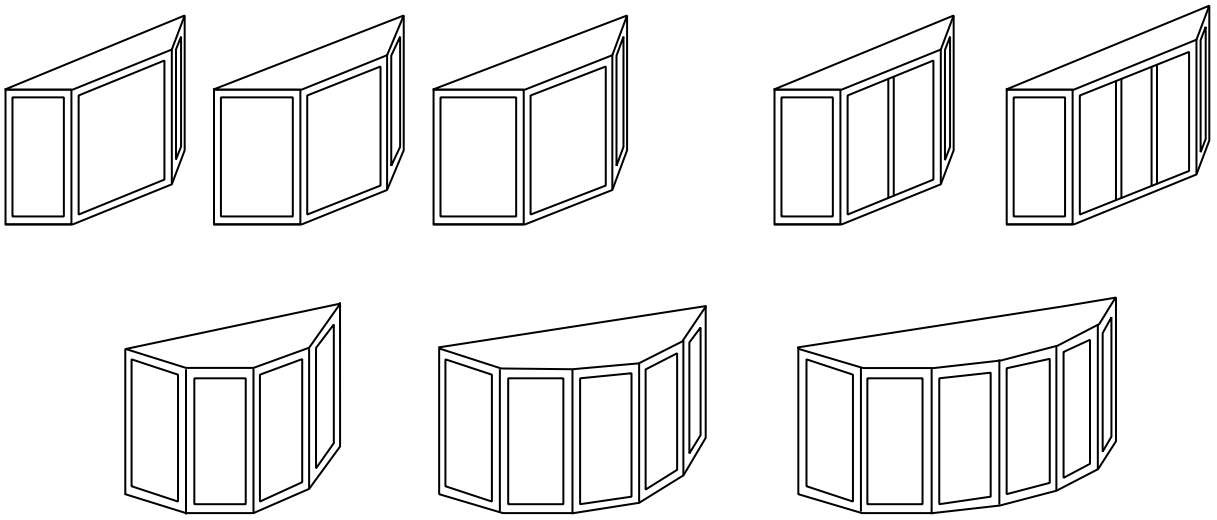
If you are concerned that the suspended ceiling is not strong enough to hold the blinds, you can add fixing wires to pattresses and run these to the main ceiling to add additional support.

5.0 Glossary

Bay Window

A bay window is a window space projecting outward from the main walls of a building and forming a bay in a room.

Available in a number of different styles and designs some popular types are rectangular or three or five sided bays.



Cill or Sill

A slab of stone, or more typically a section of wood, at the base of the window, hence window cill / sill.

Face Fix

Here the brackets are fixed in the horizontal plane back to the window or its surrounds.

Grounds

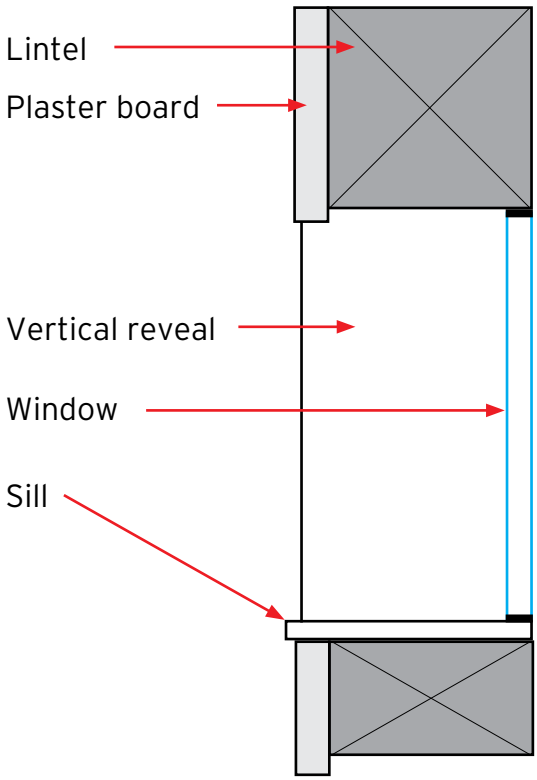
This is a generic term used to define the materials or substrate you are fitting to – it could be wood, masonry, steel or another material. It is often used when the fixing substrate is unknown.

Inside Recess or Inside Reveal

A recess is where the wall typically has a 90 degree return which then meets the window so the window is recessed back from the internal wall. The depth of the recess, or reveal, will vary depending on the age and style of the house and the type of window used.

A blind fitted inside the recess would then be close to the window and contained within the reveal of the window.

Cross section of a typical house window



Lintel

A load-bearing component that spans an opening such as the uprights of a door or window between two columns or piers to support the weight of the wall above the opening. Typically made of steel but concrete lintels are also used.

Cavity Wall

External Solid Wall Construction

Timber Frame Construction

5.0 Glossary

Outside the Recess or Outside the Reveal

Fitting a blind outside the reveal means installing the blind over the extremities of the recess leading into the window so the blind is level with the internal wall finishes and typically some distance from the window.

Side (End) Fix

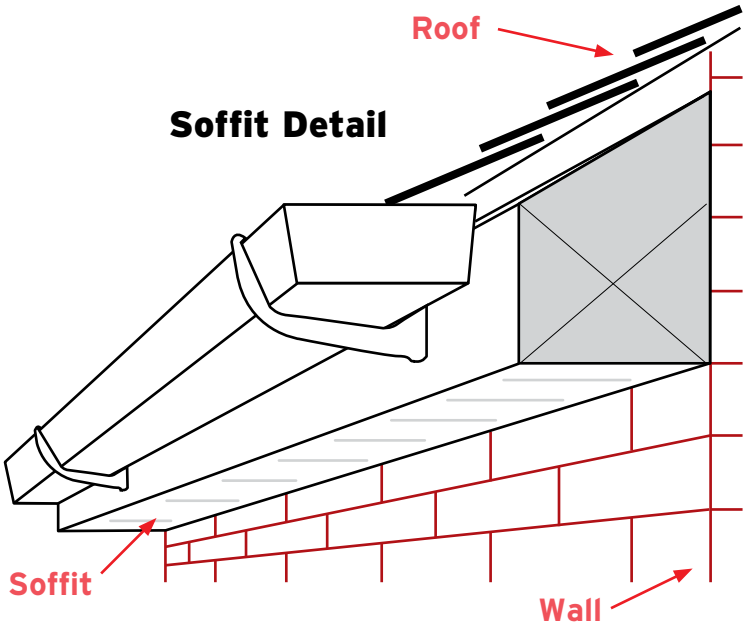
Here the brackets are fixed sideways to the reveal of the window.

Soffit

An architectural term to describe the underside of any construction element.

On an internal blind a soffit is the top part of the window reveal.

On an external blind, especially fitted on a bungalow, the soffit is the section where the overhang of the roof meets the external wall of the building.



Top Fix

Here the brackets are fixed in the vertical plane upwards usually into the soffit above the window.

Other Modules in this series

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