Top ten tips for timber cladding

Timber cladding provides an attractive, economic and environmentally friendly way to enclose buildings. Lewis Taylor offers tips for specifiers

There are many factors to consider when choosing, specifying and installing timber cladding. Here are some of the key points to help you to get the best from this versatile material.

Tip 1: Species

The choice of timber species is normally based on three main considerations: aesthetics, durability and cost. It is normal to start with the consideration of durability and then look at cost and aesthetics of the species available which offer the required service life.

BS 8417:2011 + A1:2014 *Preservation of wood. Code of practice* provides guidance on the minimum anticipated service life of timbers in various different applications. Table 3 of this standard lists the anticipated service life of coated and uncoated timber cladding depending on the durability of the timber used. This table extracts this information for cladding.

Durability classes for timber cladding

Condition	Desired service life		
	15 years	30 years	60 years
Coated	4	3	2
Uncoated	3	2	1

The durability classes are:
1. Very durable
2. Durable
3. Moderately durable
4. Slightly durable
5. Not durable

These durability classes refer to the heartwood only. The sapwood of any timber species is considered not durable. When specifying timber for external cladding, the specification must exclude sapwood. It should also be understood that these are minimum anticipated service life predictions, and many factors (such as design) can prolong or shorten the service life.

Common softwood species used for timber cladding are:
- European redwood and European whitewood (both slightly durable)
- Larch (slightly to moderately durable)
- Imported Douglas fir (moderately durable)
- Western red cedar (durable).

Due to its natural durability, western red cedar is a common and popular choice for uncoated external cladding and can provide a 30-year service life. Douglas fir and larch can also be used uncoated, but will typically only achieve a 15-year service life. Whitewood and redwood can also be used for external cladding but would normally be preservative treated and coated – it is important that the surface coating is appropriate and well maintained.

Common hardwood species are oak and sweet chestnut, both of which are durable. There are many other hardwood species which could be considered, and information on their durability can be found on the TRADA Wood species database at **www.trada.co.uk**.

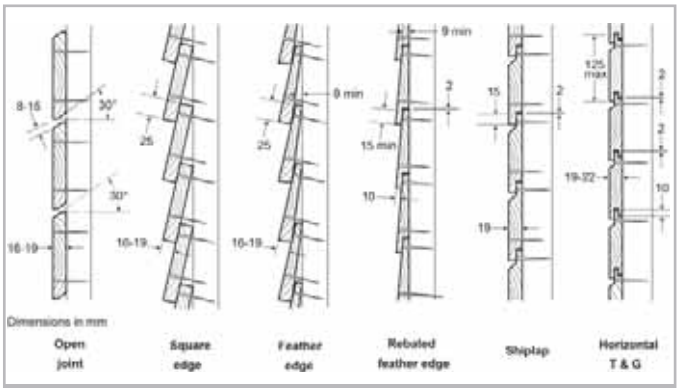
Modified woods are also available for use as external cladding. These are either thermally or chemically modified to enhance their natural durability. Guidance should be sought from the manufacturer/supplier of the product on anticipated service life and installation methodology. (See TRADA's *WIS 2/3-63 Modified wood products* for further information on products available.)

Tip 2: Profile

The choice of profile predominantly comes down to aesthetics. There are two things to consider however, the first being the width of the cladding boards. BM TRADA recommends that board widths are limited to 150mm maximum to reduce the overall shrinkage or swelling which will occur with moisture content changes. Tongued and grooved boards should be limited to a maximum width of 125mm to reduce the risk of the tongues disengaging from the grooves when the boards shrink.

The second consideration is whether it is an open- or closed-jointed cladding system. Open-jointed cladding systems can allow substantial water penetration and exposure of the substructure to UV.

Special consideration needs to be given to waterproofing details around window and door openings and it may be necessary to use a specialist UV-resistant breather membrane on the substructure behind.



Horizontal boarding profiles

Tip 3: Fixings

Softwood cladding boards are normally nailed onto timber support battens with stainless steel nails. It may be possible to use galvanised nails if the boards are to be painted, but BM TRADA recommends that stainless steel nails be used.

If using plain wire nails, the nails should be long enough to achieve a point-side penetration of 2.5x the thickness of the cladding board into the support batten. For example, when fixing a 20mm thickness board, there should be 50mm of nail penetration into the batten using nails of 70mm length.

Annular ring shank nails (sometimes called improved nails) only require point-side penetration of 2x the board thickness. For example, 40mm of nail penetration for a 20mm thickness board using 60mm length nails. Two nails are normally used at quarter points across the width of the board.

Screw fixing of hardwood cladding

Hardwood cladding boards are normally screwed to the battens using stainless steel screws – again two fixings used at quarter points across the board. Holes should be pre-drilled in the cladding board and slightly oversized to allow expansion and shrinkage of the board.

Tip 4: Support battens

Cladding boards are usually fixed to preservative-treated softwood cladding battens. These will normally be oriented perpendicular to the cladding boards: horizontal cladding boards on vertical battens; vertical cladding boards on horizontal battens. Depending on the board profile and installation method, vertical counter battens may be installed first to provide drainage and ventilation. Horizontal battens should have their top edge angled to shed water.

Tip 5: Ventilation

The space behind the cladding created by the cladding battens should be drained and ventilated. This serves three purposes:

- If the cladding is fixed to a timber frame building, the drainage and ventilation help to ensure long-term durability of the structure.
- The ventilation space allows cladding boards to dry more rapidly after wetting.
- The ventilation space helps to equalise the moisture content of the inner and outer faces, and reduces the risk of the boards cupping.

Flashing details at the base of the cladding and around windows and doors should be designed to shed water away from the building while maintaining the required ventilation. Check the requirements for fire-resistant cavity barriers with local building control and consider using third-party approved, ventilated cavity barriers where needed.

Tip 6: Coatings

Before specifying the application of a surface coating, consider the anticipated service life of the coating and the required maintenance regime, and make sure that the building owner understands what maintenance is required.

Clear coatings such as oils and varnishes will normally require pre-emptive re-application approximately every 12 months and, for that reason, BM TRADA does not recommend their use. In addition, if the surface coating does fail leading to discolouration or weathering of the wood, simply re-applying the coating will not be sufficient and will seal in the discolouration and trap moisture. Paints and stains will have a longer service life but will still require periodic and pre-emptive re-application.

Tip 7: Detailing

The design of the cladding should avoid moisture traps and projections which will allow splash back onto the cladding. Cutting the ends of vertical cladding board to an angle will allow moisture to drip from the ends of the boards more easily. Where end grain of boards is present,

for example at a running joints in the cladding or where the end of a board meets a corner post detail, a gap of at least 8mm should be left to reduce the chance of water sitting against the end grain and being held there through surface tension.

Cutting the ends of vertical cladding board to an angle allows moisture to drip from the ends of the boards more easily

Tip 8: Installation

Store cladding boards spread out on stickers (small timber strips to spread and separate the boards) and cover loosely to reduce the exposure to moisture and allow air flow around all boards. This will greatly reduce the risk of discolouration to the timber.

Ensure that the moisture content of the cladding is between 16% and 18% at the time of installation. This will reduce the likelihood of significant movement or distortion of the cladding.

If surface coatings are to be used, they should be applied to all faces before the cladding is fitted. Finishing the cladding after installation may result in areas of unfinished wood becoming visible when the cladding swells or shrinks.

Tip 9: Weathering

If the external timber cladding is to be left uncoated, it will weather naturally and turn silver-grey over time, due to exposure to moisture and sunlight. Uncoated external timber cladding will always weather and this should be expected. As discussed above, the use of clear surface finishes to preserve colour is not recommended due to the maintenance required.

Tip 10: Discolouration

During the weathering process, discolouration or differential weathering of the cladding can sometimes occur, leading to staining or an uneven colour. There can be many reasons for this, but one of the more common reasons is extractive staining (sometimes called tannin staining). The term 'extractive' refers to a complex mix of water-soluble compounds present in timber. Some timbers, such as oak and western red cedar, have far more extractives, and are more prone to this type of discolouration. When the cladding is wetted, these extractives are mobilised and brought to the surface of the wood. Normally rainwater running down the cladding would wash these extractives away (potentially discolouring other cladding, such as render, below). If the timber cladding is sheltered fully or partially from rain water, these extractives will still come to the surface but will not be washed away and can result in surface staining.

Western red cedar cladding showing characteristic 'tide' marks in areas receiving differential amounts of rainfall

This staining can be removed and the surface of the wood brought back to a natural colour, or it may naturally fade over time if the area in question is only partially sheltered. See TRADA's Research summary *Restoring discoloured uncoated timber cladding* and *WIS 2/3-60 Specifying timber exposed to weathering* for further information on weathering.

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Supporting services

Visit the Bookshop at www.trada.co.uk for this related publication:

- *External timber cladding,* 3rd edition, BM TRADA, 2013

For further information on cladding contact the TRADA telephone advisory service on +44(0)1494 569601