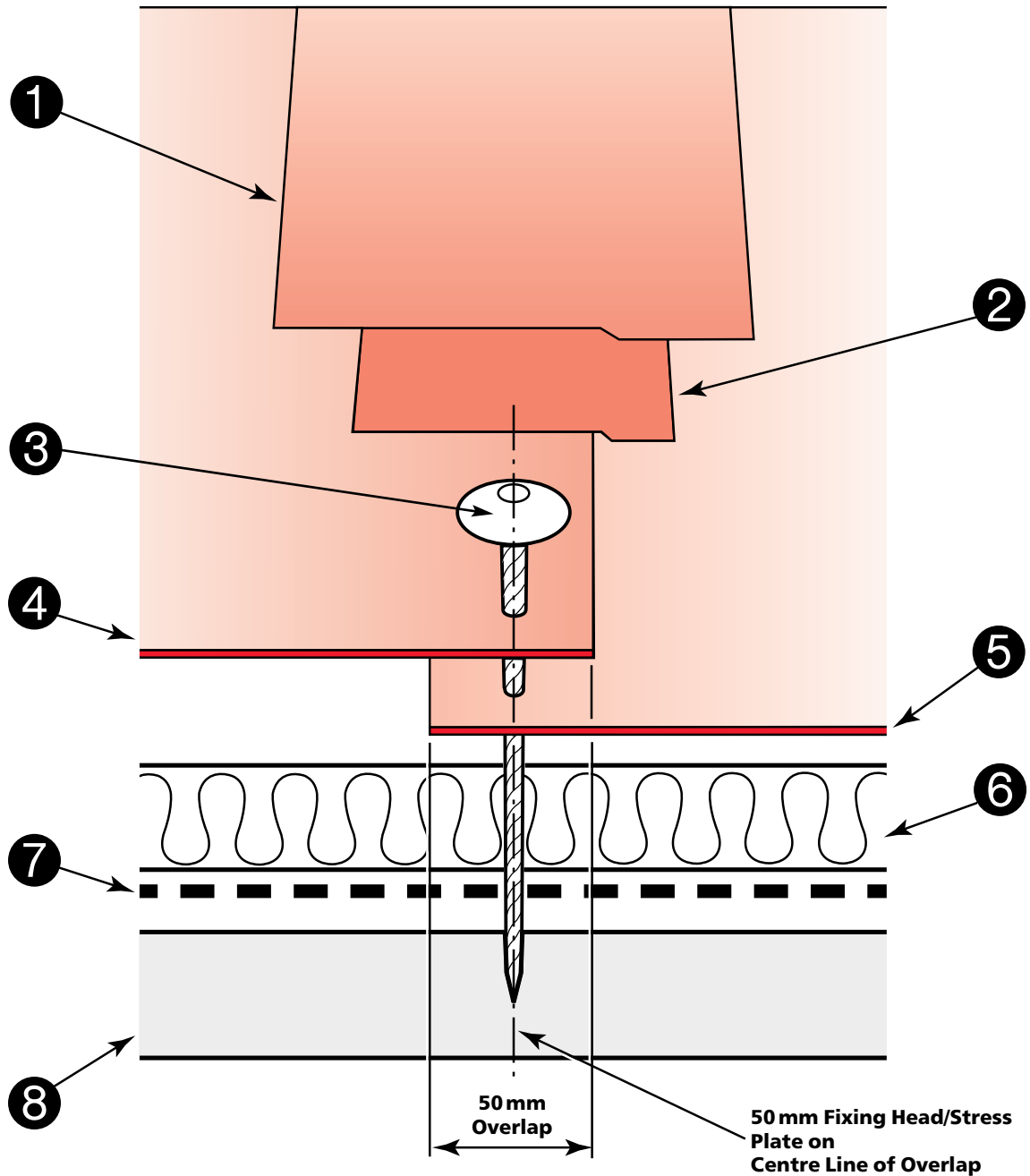


## Fixing Detail

Typical fixing, lap joint and lamination configuration



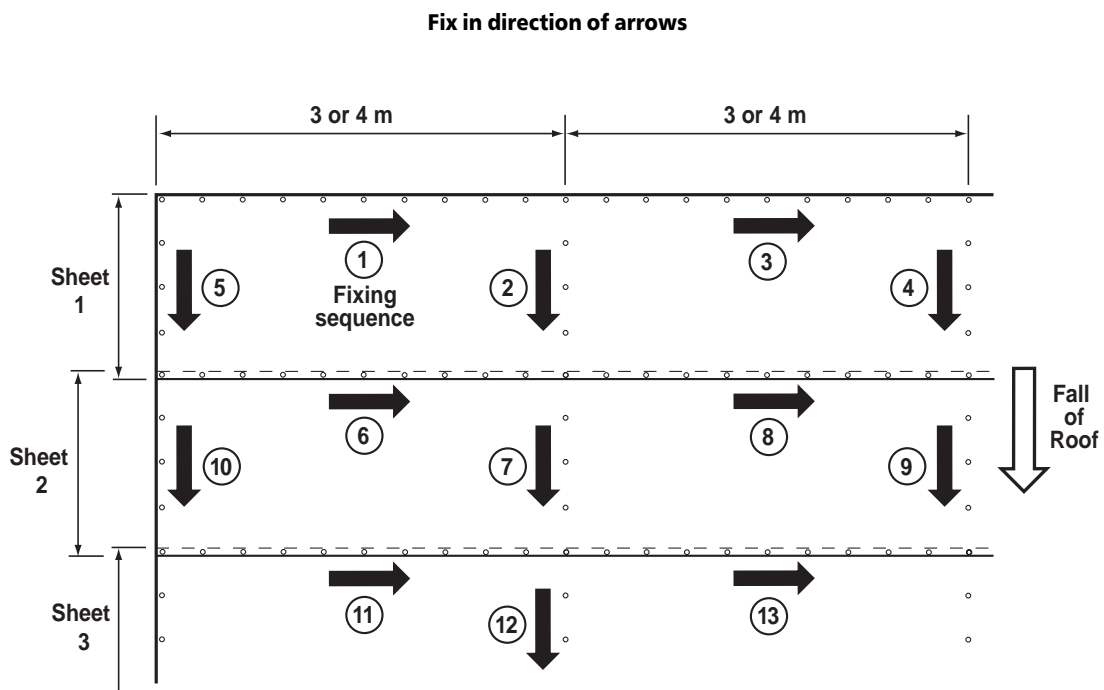
**Key**

- |                          |                        |
|--------------------------|------------------------|
| ① SEAMING TISSUE         | ⑤ DRYSEAL MEMBRANE     |
| ② CHOPPED STRAND MATTING | ⑥ INSULATION           |
| ③ ANTI-CORROSIVE FIXING  | ⑦ VAPOUR CONTROL LAYER |
| ④ DRYSEAL MEMBRANE       | ⑧ SUBSTRATE            |

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## Optional Fixing Recommendation

Recommended fixing method for a typical cross stitch detail. Cross fixing may be employed where there is a requirement to install greater numbers of fixings to resist high levels of wind uplift and, in certain circumstances may reduce the apparent undulation of the installed membrane. For full detail on specific fixing methods refer to the appropriate section in the Technical Manual.



**For roof edge fixing**  
see **Specification Detail Section**  
of the **Technical Manual**  
(Section D)

1. Cut sheet to desired length.
2. Lay sheeting onto the roof starting at the high point.
3. Make temporary fixings at sheet ends, or hold sheet in position using weights.
4. Proceed with seam fixings, working either from one end of sheet or from centre of sheet towards the ends up to cross fix line position. Cross fix leaving opposite edge of sheet free and continue seam fixing to next cross fix line. Repeat cross fix.
5. Finally, release temporary fixings or weights from sheet ends and secure with final fixings.
6. All sheet overlaps must be a minimum of 50 mm.
7. The location point for the line of fixings is at the centre of the 50 mm overlap when using 50 mm stress plates or fixings with a head diameter of 50 mm. When using smaller stress plates or smaller headed fixings, the fixing should be moved closer to the edge of the upper sheet ensuring that the stress plate or fixing head does overlap this edge.
8. All fixings should be located at appropriate centres according to the type of fixing used, the substrate material and the required uplift resistance making allowance for recommended safety factors.

## Laminating and Top Coating Methods

**Always familiarise yourself with all handling and health and safety requirements relating to all the products prior to opening any containers and always wear protective gloves and suitable eye protection.**

### Preparation

Sweep clean all surfaces and check all fixings are tight and secure. All surfaces to receive laminate are to be clean and dry, free of dust, oil and chemical contamination. Cleaning with a cloth or mop and fresh clean solvent is normally sufficient, but if this is not the case in areas of severe contamination, abrade before then cleaning with approved solvent cleaner. Pour a small quantity of approved cleaning solvent into a small bucket to effect periodic cleaning of tools whilst work is in progress.

### Mixing Resin and Catalyst

Pour resin into calibrated bucket as required, mix in small quantities to avoid waste.

Add MEKP catalyst – 1% to 3% by volume in accordance with temperature. Sprinkle catalyst onto resin whilst stirring. Continue to stir for a further minute ensuring that catalyst is evenly and thoroughly dispersed.

Minimum catalyst: 1% i.e. 10 ml per litre of resin.  
Less than this amount may result in under curing.

Maximum catalyst: 3% i.e. 30 ml per litre of resin.  
More than this may retard or cause irregular curing.

It is important to keep the different types of catalyst separate from each other.

As temperature variations affect curing time considerably always test a small batch first. Review the situation throughout the day as temperatures increase or decrease.

Further quantities of resin may be added whilst ever the mix remains in liquid form. Add more resin to the existing mix and stir in thus slowing the cure before adding and mixing extra catalyst as required.

Should the mix start to gel whilst laminating, immediately stop using and leave to cure fully in bucket. This can then be broken out later leaving the bucket clean to use again. Continue using a new mix in a clean bucket.

If working in very hot conditions the resin should be kept as cool as possible and always out of direct sunlight prior to use. **Too fast a cure under any conditions may result in inadequate bonding.** If cure is still too fast, change to **low** reactive catalyst.

If working in very cold conditions the resin should be kept as warm as possible. Having released the lid, the containers may be placed in larger containers of hot water prior to use. **Do not store/leave in a vehicle overnight prior to use when cold.** If cure is still too slow, change to **super** reactive catalyst.

**Laminating should not be attempted at temperatures below 5°C or where the temperature will fall below 5°C before cure.**

### Seams, Laps and Exposed Fixings

Method:

1. Using 75 mm soft roller apply coat of resin mix to seam/lap and over exposed fixing.
2. Roll 100 mm glassfibre chopped strand mat onto resin mix over seam ensuring parallel and good cover of both sheet edge and fixing.
3. Still using 75 mm soft roller, generously apply second coat of mix over chopped strand mat and leave to saturate. Apply more resin to any remaining 'dry' spots.
4. Still using 75 mm soft roller lay 150 mm seaming tissue over mat ensuring equal cover over both edges of mat below.
5. Using special finned roller, consolidate ensuring that all air is expelled from laminate.
6. Remove any spillage or drips as work progresses. Check all the seams and fixings are adequately covered then leave to cure.

**Only lay sufficient laminate to ensure consolidation of both mat and tissue can take place before curing occurs.**

### In Situ Laminating to Details

Method:

1. Pre-cut suitable lengths of glassfibre chopped strand mat and seaming tissue.
2. Using 75 mm soft roller or paint brush, place chopped strand mat onto off-cut of board or flat sheet and apply a coating of resin mix and allow to saturate.
3. Using 75 mm soft roller or paint brush, apply coat of resin mix to prepared surface or detail to receive laminate.
4. Lay wetted chopped strand mat onto resin mix applied to detail.
5. Using roller or brush, apply second coat of resin mix to detail and further chopped strand mat as required ensuring no ponding of resin occurs and that glass fibres are not dragged from required position.
6. When good saturation is achieved, lay seaming tissue onto second coat of mix.
7. Using small finned roller or paint brush, consolidate detail expelling all air from laminate and effect final detailing/shaping.
8. Remove any spillage or drips as work progresses. Check all seams and fixings are adequately covered then leave to cure.

**Ensure consolidating and final forming to detail with surface tissue layer takes place before cure occurs.**

Where the lamination is not fully supported by pre-cured GRP material, it is then necessary to apply a second layer of lamination when the first has cured.

To achieve good consolidation of laminate when using paint brushes, shorten bristles by up to half and compact joint or detail using 'stippling' technique.

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## Laminating and Top Coating continued

### Top Coat

Immediately prior to the application of the top coat, the flat sheet, trims and in situ laminate should be cleaned as previously described for the application of the laminate.

Thoroughly stir top coat whilst in original container to ensure even dispersal of both pigment and wax contained in product.

Pour required amount of top coat resin into large calibrated bucket allowing 1 litre of top coat per 3 m<sup>2</sup> maximum of area to be covered. The top coat should be applied using a roller.

Add MEKP catalyst – 1% to 3% by volume in accordance with temperature and as for laminating resin. Sprinkle catalyst onto top coat whilst stirring. Continue to stir ensuring that catalyst is evenly and thoroughly dispersed and no traces of catalyst remain on surface.

It is important to keep the different types of catalyst separate from each other.

As temperature variations affect curing time considerably always test a small batch first. Review the situation throughout the day as temperatures increase or decrease.

Should the mix start to gel whilst applying, immediately stop using and leave to cure fully in bucket. This can then be broken out later leaving the bucket clean to use again. Continue using a new mix in a clean bucket.

If working in very hot conditions the top coat should be kept as cool as possible and always out of direct sunlight prior to use. Mixing larger quantities will accelerate cure whilst still in bucket and may prevent application of all of mix. **Too fast a cure under any conditions may result in inadequate bonding.** If cure is still too fast, change to **low** reactive catalyst.

If working in very cold conditions the top coat should be kept as warm as possible. Having released the lid, the containers may be placed in larger containers of hot water prior to use. **Do not store/leave in a vehicle overnight prior to use when cold.** Mix and apply top coat in smaller quantities with a good level of catalyst rather than larger quantities and a low level of catalyst. If cure is still too slow, change to **super** reactive catalyst. Super reactive catalyst should not be used with top coats unless applying during the lowest of normal working temperatures, i.e. close to 5°C.

**Top coating should not be attempted at temperatures below 5°C or where the temperature will fall below 5°C before cure.**

Top coat applied too thinly or with insufficient catalyst for the temperature at application will suffer from undercure, particularly at the surface. This will lead to erosion, loss of colour and poor long term bonding. Applied too thickly, the top coat may crack as it contains no reinforcement.

### Mixing of Catalyst with Laminating and Top Coat Resin

Catalyst	Temp °C	1 Litre	2 Litres	8 Litres
<b>Super Reactive</b>	4 - 6°C	20 - 25 ml	40 - 50 ml	160 - 200 ml
<b>High Reactive</b>	7 - 9°C	25 ml	50 ml	200 ml
	10 - 14°C	20 ml	40 ml	160 ml
	15 - 18°C	15 ml	30 ml	120 ml
	19 - 23°C	10 ml	20 ml	80 ml
<b>Low Reactive</b>	16 - 20°C	20 ml	40 ml	160 ml
	21 - 24°C	15 ml	30 ml	120 ml
	25°C plus	10 ml	20 ml	80 ml

Use of the Catalyst at the rate of less than 1% by volume may result in undercure causing problems later. For specific installation advice with regard to timescale see page F6.

Use of the Catalyst at the rate of more than 3% by volume will not improve cure time and may result in an unbalanced cure causing problems later.

### Tools

Always place tools in approved cleaning solvent when not in use and clean in same periodically as work progresses. On completion, clean tools with solvent in small bucket. When working on larger jobs or moving onto another job soon after, immerse tools in cleaning solvent in large sealable container to transport or to store.

## General Installation Requirements

### Installation Requirements

1. Roofs are to be kept clear of debris throughout installation.
2. Where practical, keep external surfaces free of contamination and as clean as possible prior to application of laminating resin and top coat.
3. To ensure good secondary bonding of both laminating and top coat resins, it is essential to minimise the exposure of incomplete parts of the installation to weathering and UV light. Whenever possible, the work should be divided into sections and completed as such.  
If the top coat cannot be applied to the in-situ lamination work within 2 - 3 days of application, it will be necessary to lightly abrade these areas before cleaning with fresh clean solvent in the approved manner.  
The DRYSEAL membrane and trims should not be fitted and exposed to the elements for more than 28 days before completion by laminating and top coating. If this is unavoidable, it will be necessary to abrade the entire exposed surface before cleaning with fresh clean solvent immediately prior to the application of any further resin or top coat.  
Whilst abrading any part of the system, care should be taken not to remove excessive amounts of material or damage any in-situ lamination covering and protecting any fixings.
4. All drains, gullies and outlets must be free of blockage. A final check should be carried out prior to application of laminating resin and top coat. Outlet strainers or filters must be fitted to prevent future blockage.
5. If the roof is to be subjected to regular traffic for maintenance or plant room access, then a designated walkway must be installed either by forming from heavy duty sheet, depicted by using a different coloured top coat, which can be made slip resistant if required. Alternatively, approved walkway tiles or walkway matting can be installed.
6. Air conditioning equipment or other plant must be mounted on an approved proprietary support system or on slabs with adequate insulation.
7. Any slabs, cable supports and plinths must be sited on a bed or layer of adequate approved insulation material.
8. DRYSEAL roofs should not be subject to any point loading without adequate protection, i.e. timber support under ladders.
9. If at any time a repair, alteration or an extension has to be made to a DRYSEAL system, the top coat must be ground back to expose the base layer which should then be cleaned using approved cleaning solvent before applying any further roof laminate. This work should only be undertaken by approved contractors.
10. The DRYSEAL system will accept bituminous felts but a bituminous primer must be applied first.
11. Do not use naked flames in the vicinity of any liquid resins or uncured/wet lamination and top coat.

12. Do not allow any work within the vicinity of the uncured/wet lamination which may result in sparks occurring.
13. Whenever any significant quantities of unused resin or top coat are left in containers after the addition of catalyst, potential vapour and exotherm hazards should be eliminated by pouring a generous amount of water onto the gelled mass to adequately submerge it.
14. The solvent cleaner is easily ignited and should be removed from the roof if using any naked flame.
15. Do not apply naked flame directly to the DRYSEAL system.

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**Hambleside** 

**Danelaw**

## General Installation Requirements continued

### Climatic Advice

1. **Do not apply the DRYSEAL system in wet or damp conditions.**
2. **DO NOT apply the DRYSEAL system in temperatures below 5°C.**
3. **DO NOT apply the DRYSEAL system over frozen surfaces.**
4. **DO NOT apply the DRYSEAL system in high winds.**
5. **DO NOT apply the DRYSEAL system if rain is imminent.**

### What to do in the event of the following:

**Operation:** Mixing resin and laminating in **cold conditions.**

**Problem:** Resin very slow to cure.

**Solution:** Do not store resin in vehicle overnight. Preheat resin containers. Place resin containers into hot water. Use a larger container and half fill with hot water. Keep resin in a pre-heated condition.

**Note: Do not bring to boil. NO NAKED FLAMES.**

**Operation:** Mixing resin and laminating in **hot conditions.**

**Problem:** Resin curing too prematurely.

**Solution:** Keep resin cool, use insulated containers.

**Operation:** Laminating Joints.

**Problem:** Temperature dropping below 5°C whilst laminating.

**Solution:** Stop laminating, tape joints with waterproof tape, until temperature rises above 5°C.

**Problem:** Water contamination.

**Solution:** When rain has stopped, dry out roof using mops, etc. Dry off joint and skim off uncured laminate. Grind off any areas that have cured to an uneven finish. Re-laminate joint.

**Note: Check prior to this operation that no water has entered the underside of the system.**

**Operation:** Fixing DRYSEAL system prior to application of top coat.

**Problem:** Water under the system.

**Solution:** If heavy rain occurs prior to completion of all laminating, check no water has entered the underside of the system. Should any excessive water be evident remove section of the DRYSEAL covering for access to roof deck and draw off water. If it is not possible to totally dry off the area, moisture will be vented off through the system. Replace DRYSEAL section and laminate joints. Alternatively, temporary vents can be installed.

**Operation:** Application of top coat.

**Problem:** Top coat does not appear to adhere to DRYSEAL membrane and joints.

**Solution:** Please contact our technical department immediately.

**Note: There are many situations that prevail on-site and it is not possible to cover them all in this section. Hambleside Danelaw Technical Services Department is available to provide you with advice and on-site support.**

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## General Maintenance

The following instructions must be adhered to:

1. Roof must be kept clear of all debris and periodically cleaned.
2. Roof must not be subjected to point loading without adequate protection, i.e. timber support under ladders.
3. Foot traffic must be moderate and flat soled shoes must be worn at all times. If the roof is subjected to regular foot traffic for maintenance to plant and equipment, etc., then a designated walkway must be fitted. A walkway can be formed in a heavy duty GRP flat sheet, which is fitted at the time of the roof installation or, alternatively, can be fitted at a later date. The walkway can be depicted by using a different colour top coat. It can also incorporate an anti-skid topping.
4. All drains, gullies and outlets must be kept free from blockage. It is advisable to install outlet filters or strainers. During the winter period it may be necessary to check the filters or strainers on a regular basis to keep the roof outlets free running.
5. If at any time an alteration or an extension has to be made to the roof, Hambleside Danelaw must be informed. All works in connection with the DRYSEAL system must be carried out by an approved contractor.
6. DRYSEAL may be cleaned with warm water and detergent. Persistent staining may be removed by rubbing with a bristle brush. Tar or grease deposited from industrial atmosphere may be removed with white spirit. Small holes may be repaired with laminating resin, glass fibre mat and tissue. Larger holes should be patched by fixing flat sheet and over-laminating at laps.

Please contact our Technical Services Department for further information.

**We would be pleased to offer you assistance and advice on any one of the points under the maintenance programme.**