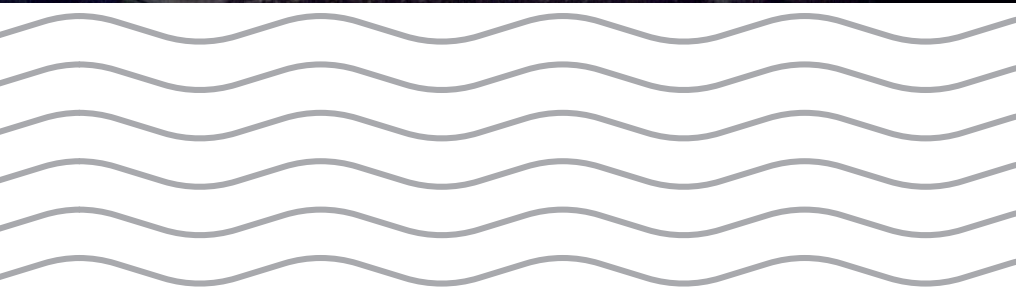


SINGLE PLY ROOFING – A SECURE ROOF FOR YOUR HOME





EDUCATE ~ INSPIRE ~ INFLUENCE ~ CREATE

HOMEOWNER GUIDE



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1 WHAT IS SINGLE PLY?

- ~ Single ply membranes are made from oil which is converted to flexible, highly durable polymers, which are processed into large sheets and supplied either rolled or folded (depending on the polymer type).
- ~ Depending on the type and method of installation, products may include internal reinforcement and/or a fleece backing on the underside, but all are in the range 1.1-2mm thickness (of membrane) and are laid in a single layer.
- ~ Single ply has been widely used in the UK since the late 1970's and covers many of the country's well know landmarks such as airports, sports arenas, supermarkets, schools and hospitals. More recently it has become very popular in housing of all types and it's easy to see why.



2 WHAT CAN SINGLE PLY OFFER?

COMPARED WITH MORE TRADITIONAL PRODUCTS, SINGLE PLY CAN OFFER A RANGE OF ADVANTAGES:

- ~ Highly durable products with a UK track record exceeding forty years.
- ~ A choice of colours including white, dark grey, black, terracotta and 'copper' green.
- ~ Lightweight and easy to install.
- ~ Quick to install without the need for naked flame anywhere on the site.
- ~ A choice of installation methods to suit any design challenge:
 - Mechanically fastened: sheets are secured by special fixings placed in the laps, under cover strips or underneath the membrane.
 - Adhered: the sheets are bonded to the deck or insulation below.
 - Ballasted: all the parts of the roof system are held down by heavy weight such as concrete paving, stone or a green roof.
- ~ No maintenance other than regular checks (see 11 below).
- ~ Simple to repair, modify or renew.



3 WHAT ARE THE OPTIONS?

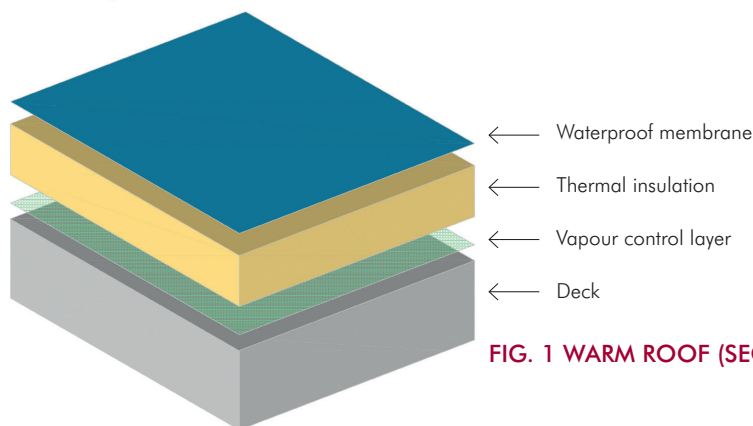
ESSENTIAL PARTS OF A MEMBRANE ROOF:

In a flat roof, the waterproofing is always supported by a structural roof deck. This is usually a timber boarding of some type, which in turn is supported on joists. The ceiling, if any, is usually fixed directly to the underside of the joists. Garages may be un-insulated, but roofs above the habitable part of the property will be insulated.

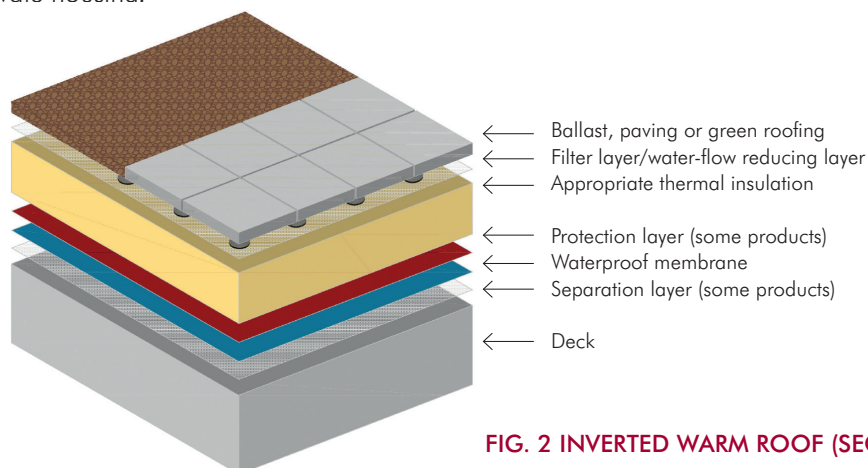


ROOF TYPES: THERE ARE THREE BASIC TYPES OF MEMBRANE ROOF:

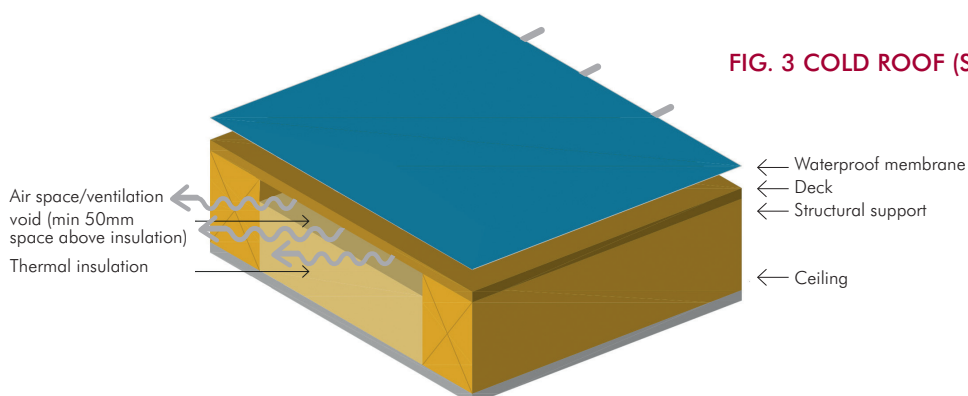
WARM DECK: the single ply membrane is laid over insulation which is placed above the deck. This keeps the deck warm during cold weather and manages condensation without the need for ventilation. A 'vapour control layer' (VCL) is laid over the deck to control water vapour entering the insulation. This is a very reliable and cost-effective way to insulate a membrane roof to a high standard.

**FIG. 1 WARM ROOF (SECTION)**

INVERTED WARM DECK: this works in the same way as a warm roof but the single ply membrane is protected from people and the elements by special weather-resistant insulation placed above it and held down by heavy ballast such as paving or stones. Best used for a balcony or terrace where loads may be high but unlikely to be the best option elsewhere in private housing.

**FIG. 2 INVERTED WARM ROOF (SECTION)**

COLD DECK: the traditional flat roof design, where the waterproof membrane is placed directly onto the deck and insulation is laid below the deck. A gap of at least 50mm (2ins) is required between deck and insulation, which must be open to the external air. Cold roofs are common because they are low cost, but they are at risk from condensation, especially if a well-insulated roof is required. Cold roofs are no longer recommended unless the roof is small (e.g. a dormer) and complex ventilation arrangements are present. You may be able to upgrade a cold deck roof to a warm roof provided there is enough space above the existing roof for the extra insulation. You will need a core-sample survey to check the existing construction.

**FIG. 3 COLD ROOF (SECTION)**

COMPARED WITH MORE TRADITIONAL PRODUCTS, SINGLE PLY CAN OFFER A RANGE OF ADVANTAGES:

DECKS: the deck provides continuous support to the insulation and single ply membrane.

~ **New build:** for most situations, a timber panel deck will be ideal for single ply membranes, allowing all methods of attachment (the structure must be sufficient to suit loadings):

- Plywood: must comply with BSEN 636-2. A minimum thickness of 18mm is recommended.
- Oriented Strand Board (OSB): must be of grade OSB3 (load-bearing boards for use in humid conditions) or OSB4 (heavy-duty load-bearing boards for use in humid conditions) to BSEN 300. Check if the product has an [Agrément Certificate](#). A minimum thickness of 18mm is recommended.

Particle board or 'chipboard' is not suitable for single ply roofing.

Concrete decks are also used in large-scale construction, apartments or where a heavy 'intensive' roof garden is to be installed. Visit ['The Green Roof Organisation'](#) for more details.

Composite decks are also available, comprising a plywood-topped insulation complete with vapour control layer on the underside. These must be fitted strictly in accordance with manufacturers' instructions.

~ **Refurbishment:** the existing deck must be dry and in good condition. If there have been prolonged leaks into a timber deck it will probably need replacement. Plywood and OSB are ideal products because it is economical and fasteners can be used reliably. If the existing deck is in good condition but the roof is subject to ponding this will require redesign.

INSULATION: because any loads on a warm deck roof are transferred to the structure through the insulation, a rigid material is required. The choice is important because different products offer different support and require greater or less thickness to achieve a chosen thermal installation value. This must be taken into account in the roof zone thickness (see 3d below). There are two classes of product:

~ **Cellular materials (air or a special gas trapped in the cells):**

- Polyisocyanurate (PIR) - insulation rating ***** for warm deck roofs only.



Plywood is covered by European Standards

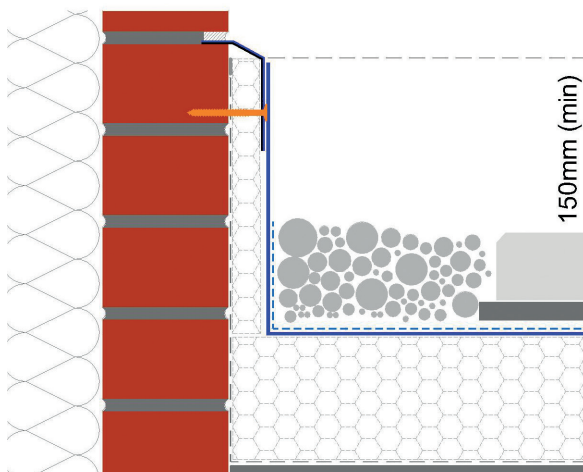


Oriented Strand Board is covered by a European Standard

- Expanded Polystyrene (EPS) – insulation rating **** - for warm deck roofs. only. Special products available for inverted roofs.
- Extruded Polystyrene (XPS) – insulation rating **** - generally for inverted roofs.
- **Fibrous materials (air held between the fibres):**
 - Mineral wool slab (MW) – insulation rating *** good for sound insulation - for warm deck roofs.
 - Mineral or glass wool (quilt) – insulation rating ** for cold deck roofs only as it is not load-bearing.

ROOF ZONE DEPTH: with any new or refurbished flat roof, the thickness of the roof from ceiling to roof surface is very important. This is because enough space must be left available for drainage falls and protection of parts of the building that the roof is built against. The waterproofing must be extended above finished roof level by at least 150mm (6ins.) (see fig.)..

ROOF FINISH: flat roofs may be finished with single ply membrane alone or by a green roof. This is suitable for occasional access (for maintenance) but additional protection from more frequent access such as window cleaning is recommended. If amenity access is required and the structure is designed to accept the load, paving or decking can be laid. Pitched roofs can be designed to look like traditional metal coverings such as lead, zinc or copper.



4 DESIGN CHECKLIST

TO ENSURE THE ROOF PERFORMS WELL, THE DESIGN MUST COVER THE FOLLOWING:

PROTECTION FROM RAIN AND SNOW

- The finished roof should have a slope of at least 1 in 80 (1.25%, 0.70). To achieve this, a design fall of 1 in 40 is advised.
- If water is not removed from a roof by a suitable slope it can cause overloading, plant growth, slip hazard and algae.
- Existing roofs:
 - If an existing roof is flat (i.e. without a slope), a fall should be introduced to ensure that the minimum finished falls are achieved on completion. This can be done quite simply by utilising tapered insulation designed to take into account any back-falls in the existing structure.
 - Ponding may not be visible if it is covered in chippings. This will need to be taken into account when designing a replacement.
- It is best to drain the roof to one or two edges.
- SPRA does not recommend internal box gutters.
- Eaves gutters are better than internal outlets.
- Outlets that pass through a parapet wall should be carefully detailed so that there is no risk of back-fall or of water running back against the outside wall.
- Internal outlets should be adequately sized to deal with storm conditions and be fitted with leaf and gravel guards.
- The waterproofing should extend up adjacent walls at least 150mm (6") from the top of the finished roof (e.g. from above paving or decking) in all situations.
- The top edge of the waterproofing system should be weatherproof. This may be formed from an extension of the single ply membrane (using a special trim) or a separate 'cover flashing' of a durable metal such as lead.
- Parapet walls should be protected by a masonry coping which falls towards the roof or a single ply capping which falls to an external drip trim.



chimney flashing

DESIGN CHECKLIST CONTINUED

PROTECTION FROM SUN AND FROST

- It pays to insulate: heating bills are lower throughout the year and rooms are cooler in the summer. Use the SPRA calculator [HERE](#) to see how quickly an upgrade will pay for itself.
- Insulation of new flat roofs and refurbishment of existing roofs must satisfy Part L of the Building Regulations.

PROTECTION FROM CONDENSATION

- Warm deck roofs always require a robust vapour control layer (VCL), laid directly on the deck.
- Cold deck roofs include adequate through-ventilation of all joist voids etc.

PROTECTION FROM THE WIND

- All roofs should be constructed to resist wind forces. These vary across the UK and are affected by building height and proximity to open country or large buildings nearby.
- An experienced contractor will be able to advise.

PROTECTION FROM PEOPLE

- Materials should be selected to suit roof usage, for example if window cleaners may have access.
- If the use is changed, e.g. to a roof terrace, the structure may have to be strengthened and Building Control approval obtained.

PROTECTION FROM FIRE

- Consult your local authority if you are planning a new flat roof.
- Most flat roof systems will meet the Regulations, but check with your contractor or for a second opinion, your local authority. The membrane manufacturer should supply a suitable certificate of fire performance.



[See our video - HERE](#)

5 WHY CHOOSE A SPRA MEMBER?

SPRA MEMBRANE MANUFACTURERS are subject to a quality audit at application and annually. The minimum criteria are as follows:

- ~ All membrane products to have independent certification of performance (e.g. British Board of Agrément certificate).
- ~ Provide design guidance and standard design details.
- ~ Supply only to registered contractors employing trained installers.
- ~ Provide off-site product training approved by SPRA.
- ~ Maintain a database of trained installers.
- ~ Issue product training cards with a stated expiry and valid for a maximum of five years.
- ~ Inspect all work above 100m² where a guarantee is to be issued.

SPRA CONTRACTORS are subject to a quality audit at application and regularly thereafter. The minimum criteria are as follows:

- ~ Safety: must be a member of a safety scheme recognised by Safety Systems in Procurement www.ssip.org.uk/
- ~ Product training: must employ installers who have passed a SPRA-approved off-site product training course.
- ~ Training policy: must commit to a fully trained workforce including attainment of appropriate vocational qualifications. Must be holders of an appropriate Construction Skills Certification Scheme card www.cscs.org.uk
- ~ Insurance: must hold current public liability and employer's liability insurance.
- ~ Tools: must use tools which have been tested for electrical safety.

6 HOW TO CHOOSE A PRODUCT

- ~ All SPRA membrane manufacturers can offer products that are suitable for residential buildings. All can provide lists of registered contractors experienced in this sector.
- ~ To decide upon a product, consider what is important for your project, for example:
 - Appearance.
 - Colour-coordination of trims.
 - Ease of future modification.
 - Secondary uses such as decking or green roofing.
 - Roof system type.

This should help to narrow the choice. It is generally best to decide on a product and then obtain competitive quotations. If you request quotations for different products it may be difficult to compare them.

- ~ All SPRA suppliers of insulation provide products which comply with The SPRA Quality Standards (available at www.spra.co.uk). So it is important to ask the contractor to provide these products.
- ~ Make sure all products used carry the CE-mark, as this demonstrates that they have been tested and assessed for compliance with basic health and safety requirements.

7 HOW TO CHOOSE A CONTRACTOR

- ~ SPRA contractors complete projects ranging from airports to residential dormers, but it pays to choose one that generally works in the residential sector. SPRA membrane manufacturers can provide details of those registered contractors which offer a private residential (small works) service.
- ~ SPRA provides a 'Request a quote' service at www.spra.co.uk. This means your enquiry will reach the best in the business.
- ~ Choose a contractor on the quality of their quotation (see 9b below) not just the price and their track record. If in doubt, ask for references you can visit especially if the appearance of the job is important.
- ~ A contractor who is busy may suffer delays if other work runs over. This must be balanced against the benefit of engaging a contractor who obtains regular work in your area.

8 DURABILITY, GUARANTEES AND INSURANCE

DURABILITY: all SPRA membrane manufacturers are required to hold certificates of fitness for purpose issued by an independent third party. This is generally an 'Agrément certificate' issued by the British Board of Agrément. You can check these certificates online [HERE](http://www.bbacerts.co.uk) (link to www.bbacerts.co.uk). All certificates include a statement of estimated service life, which is based on testing and experience.

GUARANTEES: manufacturers may offer guarantees for their products, which typically range from ten to twenty years. There are two types:

- Product-only: this most common type covers against faults deriving from manufacture or supply, provided the product has been installed correctly and the householder has maintained the roof as per instructions. They are not an indication of product quality or durability.
- Product and installation combined: these guarantees are more useful but less common. If they protect the policy-holder against the insolvency of the contractor they generally require the manufacturer to register with the Financial Services Authority because they are in effect insurance policies.
- Product and installation separately: as well as the product guarantee from the membrane manufacturer, you may be able to obtain a workmanship guarantee from the roofing contractor. Most will rely upon the contractor continuing to trade throughout the term of the guarantee. SPRA contractors are well-established companies with a good track record, but past commercial success cannot guarantee a stable future.
- ~ There's more information in the [SPRA Guide to guarantees and warranties](#)

BUILDINGS' INSURANCE: In spite of the excellent reputation of single ply technology spanning forty years, many insurance companies and brokers are unaware of its value to private householders so they may not include a suitable 'tick-box' in applications.



9 MANAGING THE JOB

GETTING A QUOTE:

- ~ Check whether you require Building Control approval. If you engage a contractor who is a member of the Competent Roofer scheme, they may be able to save time and money by providing certification.
- ~ Unless the job is a minor repair, it is best to get two or three contractors to give you a written quotation for the same work.

THE QUOTATION SHOULD INCLUDE (FOR REFURBISHMENT):

- ~ The location and area of the job. ☐
- ~ The reason the existing roof failed (if it did). ☐
- ~ Checking falls and advising of changes.
- ~ Results of a 'core sample' taken and then re-sealed, to find the exact build-up off the existing roof. ☐
- ~ The degree of stripping out that is required. ☐
- ~ How electrical power will be obtained. ☐
- ~ Whether any 'making good', for example ☐
- ~ Full details to the products intended to be used, including
 - Membrane product name and thickness. ☐
 - Whether fleece-backed. ☐
 - Method of attachment (see 2a above). ☐
 - Insulation product and thickness ☐
 - Vapour control layer (if required) ☐
- ~ How the contractor proposes to form details such as roof edges, abutments to walls and so on ☐
- ~ How long the quotation is valid for. ☐
- ~ Payment terms. ☐
- ~ Details of any guarantee offered or requested (see 8b). ☐

BEFORE WORK STARTS:

- ~ Insurance: has the contractor shown evidence of current public liability insurance?
- ~ Training: has the installer shown a card proving they are trained to install the product? All installers should hold a card and you can ask to see it. If it is not available at site the contractor should hold records or you can check with the membrane manufacturer. For SPRA members you can also contact enquiries@spra.co.uk.
- ~ Safety: check what arrangements the contractor has made to ensure work is carried out safely, including access to and from the roof.
- ~ Site condition: check around the perimeter of the job so that you know its condition before the job starts. This will avoid any disagreements afterwards.

DURING THE WORK:

- ~ Be contactable: it is always best to be at home or at least contactable because quick decisions are often required.
- ~ At the end of each day check that ladders and any ground-level equipment have been removed by the contractor.

WHEN THE WORK IS FINISHED:

- ~ Provided the work is completed to your satisfaction, the contractor is entitled to payment within the terms of the quotation, having allowed appropriate adjustments of any extras or savings. The contractor should then issue any agreed guarantee.
- ~ If you are dissatisfied with the work, we advise that you contact the contractor immediately stating in writing the grounds and allowing a reasonable (stated) period for remedial action. It is inadvisable to withhold payment for works already installed satisfactorily.
- ~ Should you not get a satisfactory response from a SPRA membrane manufacturer and/or contractor, please contact SPRA.

Note:

- Extra work? If you think some extra work may be necessary, for example to replace rotten timber, ask the contractor to give you a 'Provisional Sum' in writing, which can be confirmed as an order later on. This saves arguments about cost if something comes up whilst the job is underway.
- Special fittings? Factory-made equipment such as rooflights or solarpanels should be priced separately as a 'Prime cost sum'.

10 INSTALLATION CHECKLIST

- Membranes offered by SPRA members are only supplied to registered contractors that employ trained labour.
- SPRA Contractor members must arrange for their installers to be trained by the membrane manufacturer.
- SPRA membrane manufacturers or their suppliers must offer training courses to installers and must maintain a database of those who have passed a skill assessment.
- On large jobs over 100m² the membrane manufacturer is required to carry out a recorded inspection of the finished work. For small residential jobs of less than 100m² SPRA offers its contractors a self-certification scheme.

- Here are some of the key features of a good job:

A new plywood or OSB deck is laid 'broken bond' pattern.

☐

A new deck is fully supported at edges and nailed at 100mm centres.

☐

There are no significant gaps in the insulation and it is well secured.

☐

The rainwater flows off the roof: it does not collect in puddles that remain after a few days of dry weather.

☐

The roof surface is reasonably smooth: without large blisters or creases. Minor blisters and creases may occur initially, especially in refurbishment but will generally improve with time.

☐

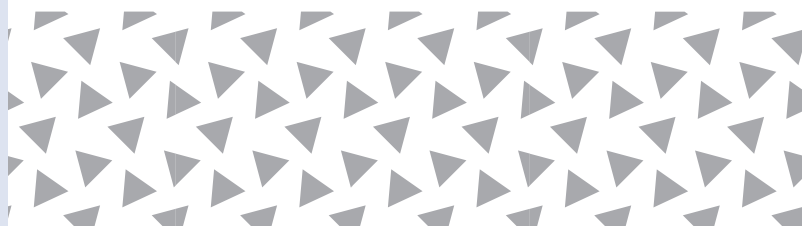
The seams are parallel to one another and properly sealed.

☐

The roof edges are neat and secure, especially at eaves into a gutter or against a house wall.

☐

Wherever the single ply membrane is turned up it is secured and if the upper edge is exposed, protected by a 'cover flashing'.

☐


11 MAINTENANCE

Single ply membranes do not require any maintenance but your roof does! This is because damage can occur or wind-driven debris can block outlets and gutters. It pays to spot these problems early.

WE RECOMMEND:

- ~ Before attempting any inspection, please ensure that access is safe and that if a ladder is necessary it is well secured.
- ~ If you are unsure of the condition of the deck, do not step onto the roof.
- ~ Because they are designed to be self-cleaning when laid to the correct falls, single ply membranes may be slippery, so take great care.
- ~ Do not use the roof as a sitting out area unless it has been structurally designed as such, has appropriate edge protection and is finished so as to protect the single ply membrane.
- ~ If occasional access is required, e.g. for window cleaning, make sure that temporary boards are used unless the roof surface is designed to accept it.
- ~ Inspect twice a year, in March and November. Try to inspect soon after rain, to see how well the water is draining away.

DECKING: timber decking is increasingly popular as a pedestrian finish on flat roofs and balconies. It can become slippery especially if sheltered from sunlight and requires occasional treatment with preservative. Always check with the membrane manufacturer before purchasing preservative products.



INSPECTION CHECKLIST

HOUSEHOLDER:

- Clear gutters and rainwater outlets ☐
- Check for wind damage ☐
- Check upstands and flashings ☐
- Check seams ☐
- Look out for ruckles or blisters which you haven't seen before ☐

If you suspect a problem with the single ply membrane, do not attempt a repair. Contact the roofing contractor immediately to comply with any guarantee terms. In an emergency, use reinforced waterproof adhesive tape to seal the roof against damage.







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