

A GUIDE TO THE

Prefix **WARM**roof®

A **TRUE** WARM ROOF SYSTEM

Prefix **WARM**roof®

Voted BEST Solid Roof System

The Prefix WARMroof® system is the most configurable and structurally robust, insulated and tiled roof in the UK market. Whether you are looking to build a brand new extension or replace an existing conservatory roof, our WARMroof technology underpins the design in each of our roofs to ensure they offer the very highest levels of thermal efficiency.

In this booklet, will look at the differences between construction methods for solid roofs and what the pros and cons for each may be. Solid roof systems are widely available and tend to be grouped together under the same banner, but there are some very obvious differences between them. Here we explain what installers and consumers should be aware of.



A **TRUE** warm roof

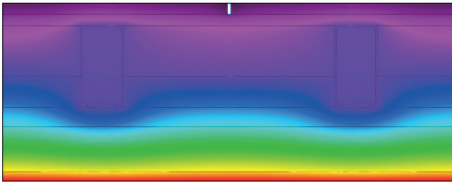
When is a warm roof **NOT** a warm roof?

As the conservatory replacement roof market continues to grow there are many systems out there for consumers to choose from, in this booklet, we explain the differences in construction and what to be aware of. Many companies claim that they are suppliers of warm roof systems, but what exactly is a **'warm roof'** construction by definition? The NHBC defines a warm roof as 'a roof with insulation placed directly below the waterproofing layer.' Therefore, a warm roof will make the entire outer face of the roof structure warmer in order to eliminate any cold bridging.

A **TRUE warm roof** will have a continuous insulation layer above the rafters and immediately below its weatherproof membrane. A warm roof construction allows heat to be conserved within a property and without the need for a ventilation system so it is more efficient and less prone to condensation build-up. A warm roof is recognised as being the most suited form of roofing to the UK climate, providing both a cost and thermally efficient solution. Most building control departments will always advise a warm roof construction is used over a cold roof alternative.

COLD ROOF CONSTRUCTION

(typical competitor roof)



Although many systems will state a warm roof construction in their promotional material, the fact that there is insulation between and below the rafters, which in turn are directly below the weatherproof deck means this is in fact a cold roof construction by definition.

Cold roofs need to be ventilated as condensation is expected to form within the roof structure, this is called interstitial condensation, and is a real problem that can build over time.

With an average room temperature of 20°C and a UK average of 50% humidity to the inside of a property, the dew point is 9°C and so condensation can affect solid, insulated tiled roofs with a cold roof construction for over half of the year. By specifying a **Prefix WARMroof®** system from the outset, there will be no call backs or remedials as a result of mould or condensation to the inside plasterboard.

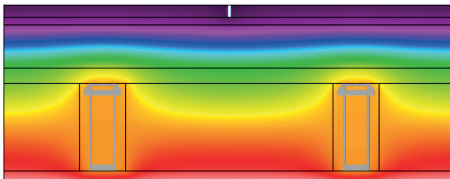
Prefix Systems designed their award winning Prefix WARMroof® system over 10 years ago, to be just that, a **'warm roof.'** All the criteria of a warm roof as defined in this booklet have been achieved.

A fully insulated eaves and soffit area cuts out any chance of thermal bridging at the head of the frame / wall junction. A continuous 70mm phenolic insulation sits above the roof rafters ensuring the entire structure is kept warm with no chance of thermal bridging or condensation forming below the roof deck.

The additional layer of insulation on the outside of the roof also ensures there is no need for additional layers of insulation on the inside of the roof below the rafters, therefore no need for unsightly add-ons or reduction of head room. The roof conforms to building control criteria of 0.15 'u' value as standard and without insulated plasterboard or additional battening on the inside, reducing the hassle for finishing the inside.

The **Prefix WARMroof®** was designed and developed by qualified, roof engineers alongside structural and environmental experts. This is the reason it is the industries

WARM ROOF CONSTRUCTION (Prefix WARMroof® System)



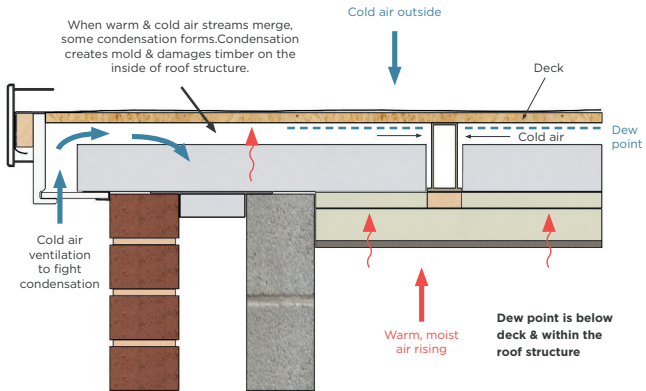
Is Ventilation needed?

Do all solid roofs **really need** ventilation?

Condensation occurs when water vapor in the air condenses from a gas into a liquid (dew point), and usually occurs when there is enough of a temperature difference between the air itself and the surface it lands on. This can happen on any cold surface and is worse in humid environments such as kitchens or bathrooms. The most apparent form of condensation is surface condensation, this is seen all around us in our homes and offices (as seen on cold window and door handles in winter).

Another form of condensation is **Interstitial condensation**, this uses this same principle in how it is formed, however, it occurs when the moist air vapour penetrates through the elements of a building's fabric, experiencing a temperature difference along the way and condensing not on the surface, but within the building fabric itself.

COLD ROOF STRUCTURE



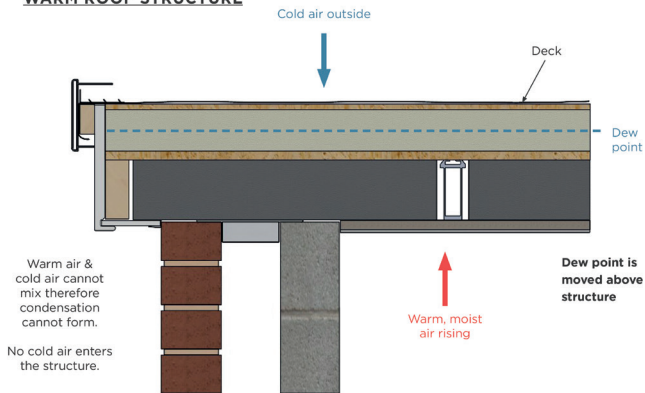
Therefore, interstitial condensation is unseen and can be eating away at the structure from the inside if not dealt with swiftly, and properly. This type of condensation is also found in cavity wall construction as well as cold roof construction where cold air meets the warm air from the building. This will deposit water in the insulation layer and this itself becomes soaked, losing its' thermal properties and efficiency. This then has a knock-on effect of cooling the wall and / or roof, then condensation will form on the inside face of the plasterboard over time. These usually takes the form of mould and appears as black spots on the plasterboard surface.

Overtime, interstitial condensation if not treated correctly, the roof structure will begin to rot and failure of roofs may become an issue. This is a real problem where timber has been used as the main structural frame of the roof and clad over/under roofs where the existing conservatory roof is left in situ.

You will see from the image on the previous page, that with a cold roof construction a ventilation space above the insulation is required to vent the water vapour that will form within the roof structure. This water vapour will soak into any timber over time causing decay. It is a continuous process of water vapour forming and is a particular issue in the UK climate in the colder, darker months when condensation is common place. Dealing with this is paramount to ensure longevity and performance of a roof structure. Many clad under roofs we see today will have condensation forming in this way and will quickly fail.

A **warm roof construction** will work to move the dew point to the outside of the structure as shown in the diagram, ensuring the warm and cold air streams don't mix within the roof space. This eliminates the need for ventilation under the roof deck and therefore the risk condensation altogether.

WARM ROOF STRUCTURE



The Prefix WARMroof®, (as a true warm roof) will do just that, the insulation is sat outside the roof structure, and between the rafters, to ensure the whole structure is kept warm and that interstitial condensation is not present within the structure. The Prefix WARMroof® requires no additional ventilation under the tiles and/or roof deck.

With no risk of rot or excessive expansion and contraction the Prefix WARMroof® will provide customers with a fit and forget product that is best in class.

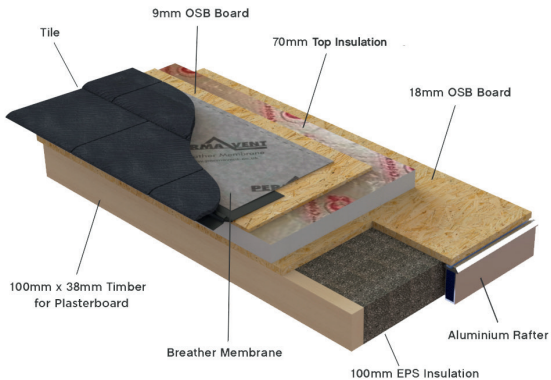
Structural performance

It's what's inside your **'Warm Roof'** that counts

Within our sector, Aluminium is the most popular material choice for solid roof construction for a variety of reasons, the main one being its' lightweight nature makes the material easier to handle over other materials like steel. It is also stronger than timber or GRP, so aluminium will span further and is more suited to larger structures particularly where bigger openings for doors are incorporated. Therefore, aluminium is more suitable with designs associated with the replacement conservatory roof sector.

Aluminium is also more stable than timber, it doesn't absorb moisture and is therefore not prone to over expansion and contraction, or indeed distortion through this process, a particular issue with cold roof construction. Longevity of the material far exceeds timber as aluminium will not rot or decay. Aluminium also has greater screw retention, ensuring no over fixing or pull through of fixings during installation which is common with GRP.

These are the main reasons why aluminium is by far the most popular material used in solid roof construction.



Timber is structurally weaker than aluminium. Therefore, when using timber much deeper sections are required making the roof very bulky. This limits the ability to have the top layer of insulation above the timber frame, as commonly seen with house roof construction. This means that most timber framed roofs tend to be a cold roof construction and not a warm roof construction in order to keep the overall depth of the roof to a workable height.

Timber is commonly available, cheap and can be easily modified making this the most common material in house roof construction, but adequate ventilation is required to avoid condensation, which would lead to roof failure if not dealt with – interstitial condensation is a real problem particularly in ‘cold roof’ designs, as described in our earlier articles, this will build up over time without the homeowner being aware until often it is too late.

Timber is absorbing and releasing moisture all the time, and so will expand and contract depending on the environmental changes. Moisture retention leads to condensation and the lack of ventilation will mean it can’t escape and caused rot, with many installers offering a minimum 10-year product guarantee, this may be a ticking time bomb for some customers.



Excessive timber movement may also result in plaster cracking over time. This is more relevant in single storey extensions where vaulted ceilings are most common in design. Aluminium due to its nature will prevent this movement ensuring a rigid structure.



The **Prefix WARMroof®** is a true warm roof and is built around an aluminium chassis (framework), this results in a very strong, stable and robust structure which also allows our customers to use not only lightweight roof tiles, but the much heavier traditional slate or concrete tile finish. The Prefix WARMroof® is strong enough to take those additional loads as well as still being a lightweight, configurable roof system.

Aluminium is also extremely environmentally friendly, being the 3rd most abundant element on the planet with over 70% of that material in use in the UK is from recycled aluminium. So this 'Green' material has the added bonus of benefiting the environment.

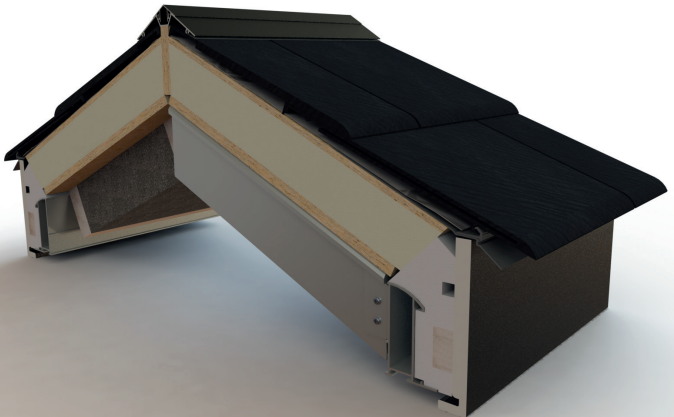
The original Prefix WARMroof® was launched over 10 years ago and is now outperforming the product guarantees, with roofs still looking as good as they did on the day they were first installed. The use of aluminium within the structure will ensure that these 'warm roofs' perform and are enjoyed for many years to come, other roofs simply won't.

Building control

Thermal performance & why conformity matters

In an effort to achieve the new minimum thermal values required to meet building regulations, some systems may have compromised on the aesthetics of the roof system instead of utilising more efficient and modern materials.

In modern construction, it is essential to ensure that buildings are energy efficient and sustainable, Building Control ensures that building designs and construction materials comply with the latest regulations and standards, the thermal performance of the materials used in new and refurbishment of buildings is a major factor.



Thermal performance is the ability to resist the transfer of heat. So, the better the thermal value, the better the roof will be at keeping heat in the room during the winter months, and the heat out in the summer. Thermal properties of the materials benefit the building in both aspects.

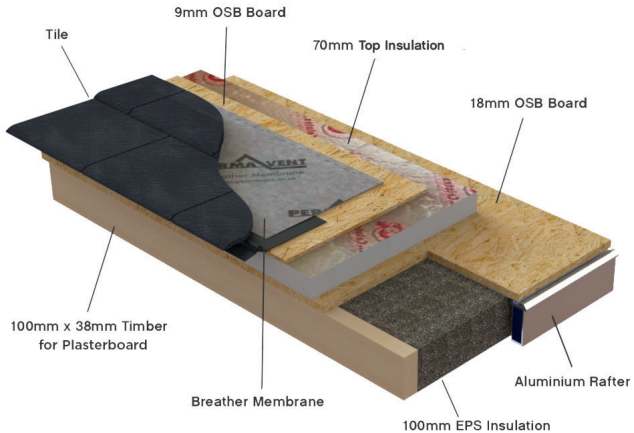
Thermal performance of a material is measured as a 'U' value. The U-value is a measure of how much heat is lost through a given thickness of a particular material, this includes the three major ways in which heat loss occurs - conduction, convection, and radiation. This is the measure that is always quoted within Building Regulations, the lower the U-value is, the better the material is as a heat insulator.

Whilst everything has a level of thermal performance, the part of the roof that provides the optimum thermal performance is the insulation, and this comes in different types, the main ones used in the solid roofing sector being:

- **Polyisocyanurate (PIR)**

- **Expanded polystyrene (EPS)**

- **Thermal blankets** - of various make-ups which trap air in layers to provide insulation.



All the existing solid roof systems will use one or a combination of these so there is little difference in the stated thermal values of the solid roofs. Part L of building regulations June 2022 recently amended the minimum requirement from 0.18 in England and Wales to 0.15 in England and 0.12 in Scotland and Wales.

Conservatories and porches are exempt from building control thermal requirements if they meet a set number of criteria. A conservatory or porch must have thermal separation (external grade lockable door) from the existing dwelling. If the thermal separation is removed or the dwelling's heating system is extended into the conservatory or porch, the conservatory or porch should be treated as an extension and therefore will fall under regulations set by building control.

Any single storey structure that has a solid roof is classed as an extension and must meet the minimum set of standards for projects in England, Scotland & Wales. Scotland tends to have more stringent regulations and therefore the U Value is lower. This is why some solid roofs don't comply in Scotland.

Most roof systems claim to achieve the required U values, but more importantly it's how those values are achieved, simply put: some are done so at the expense of aesthetics and some at the expense of fitter friendliness.

Due to the recent changes to Part L of building regulations, some systems have had to amend the amount and thickness of insulation used. We've explained the differences in construction in previous articles, a true warm roof will ensure the structure is kept warm and free from interstitial condensation as the insulation is sat over the roof structure, directly below the roof deck with no ventilation requirement. Insulation is also placed between the rafters, adding to the overall thermal performance but without sacrificing any space inside the room.

Most cold roofs have had to add this additional insulation to the internal face, some also have additional battening on the internal face of the roof to achieve U values required to conform. Stacking this internally is much less effective when compared to it being on the outer face, (a warm roof construction) which is what building control advise for modern construction in the UK. The aesthetics of a cold roof construction are also compromised as it impacts internal ceiling heights and requires unsightly add-ons to the frames in order to pack up the roof to suit.

The logo consists of a dark blue square containing the white text 'J/H/A/I' in a bold, sans-serif font.

J/H/A/I

Building Control compliant

Most companies have chosen to stick to the cheaper insulation options when seeking a solution to meet the new regulations. This has a knock-on effect with the end product in terms of quality of installation and finish. Prefix were not prepared to ask customers to accept a product that was a poorer edition of the existing system, that's why we sourced new and more efficient materials to use in the Prefix WARMroof® so customers wouldn't notice the change in specification in terms of fit and function of the roof.

The Prefix WARMroof® has been through independent testing via BRE and can achieve 0.15 'U' value as standard. The eaves can also be adapted to cater for insulated plasterboard which will take the roof down to a class leading 0.12 U value which conforms to regulations in Scotland. All this is achieved without any compromise to the finished look of the roof. Due to the innovative design of the Prefix WARMroof® a new 70mm phenolic insulation is now used to achieve the required U value and integrates seamlessly with the existing system. The warm roof make-up and fitting is the same as before the changes to Part L, with **no compromise of performance, ease of fitting or aesthetics of the finished product.**

Configurability IS important!

Why is Configurability important for a solid roof?

The solid roof market evolved as the replacement of old, inefficient polycarbonate conservatory roofs gained momentum.

High performance glass roof systems have always been popular, and the British public will always crave a well-designed glazed extension (conservatory). But fashion dictated through 1990's into the 2000's the shapes and sizes with many angled facets, valley details and cut-outs as conservatories were formed around existing obstacles on existing housing.

Therefore, in order to cater for the replacement market, the solid roofs have to have a degree of flexibility and configurability to cater for such designs. The roofs also had to be lightweight for the replacement sector, which is why lightweight tiles were perfect for such projects.



As the solid roof market took hold, the roofs were then specified as part of new build home extensions taking it away from a simple roof replacement product. This meant roofs had to be bigger, more complex, cater for wider openings but still have a foot in both new build and replacement camps. Configurability is the ability achieve numerous different functions. So, as there is an infinite amount of different roof shapes, styles, sizes, having one roof that can achieve the most configurability is very important.

The Prefix WARMroof® was developed as a 'one roof' solution, offering a truly configurable roof system which can achieve a multiple number of designs whilst still catering for larger extension projects. We believe the roof is the most configurable on the market, as our previous projects demonstrate.

This roof system is also the most robust, with spans of up to 6000mm wide without the need for tie bars or tie struts in any form. Variable soffits and the ability to take clay or concrete tiles provide numerous options for the finishing of the roof, no other system offers this option. The Prefix WARMroof® Hybrid also has the ability to glaze both a 24mm DGU's and 44mm TGU's for 'best in class thermal performance.

Configurability is key, but so is fitter friendliness. We have developed numerous products to ensure the system is a configurable as possible but without compromising on speed of installation. For instance, we have A-frames that are delivered in one piece to drop in place, no nut and bolt fixing at the ridge or radius sections. Pre-fitted Velux roof lights, no cutting or fitting on site. One piece hip and ridge capping's for use with our lightweight tile system. All designed to speed up installation.

The box gutter system on the Prefix WARMroof® is also supported by a patented eaves bracket system, this means our box gutters do not require gallows brackets or additional support, unlike most other systems out there.

The Prefix WARMroof® was awarded the 'Best Solid Roof' accolade at the GGP Awards, this was awarded as recognition for the configurability and performance of the WARMroof when compared to our competitors.





Prefix WARMroof* Collection Brochure



Prefix WARMroof* Product Guide (trade)

Prefix **WARMroof**[®]

www.prefixsystems.co.uk/warmroof

