

Installing Wundatherm Premium+ Overfloor boards

(If installing Wundatherm Premium or Budget boards, please refer to the appropriate Fact Sheet)

Wundatherm Premium+ boards have a high compressive strength (400kPa) and is fully approved by Mapei and Ultra for tiling directly onto, using their recommended flexible adhesives and without the need for a separate backer board or intermediate layer. Laminate and Wood flooring can also be installed with a suitable underlay or adhesive onto **Wundatherm Premium+ boards**. Carpet and Vinyl on the roll will require using our Duo Board or renovation screed as an intermediate layer.

All **Wundatherm** boards and transitional pipe boards have been designed for quick and simple fitting, easily cut to shape where required or routing out extra corners/ channels with a suitable bit.

Please note: We always recommend the use of a floor probe where floor finishes/coverings require floor surface temperatures to be limited - e.g Natural wood/ LVT, please check with the flooring supplier.

All Wundatherm Overfloor Boards have a choice of 3 thicknesses of aluminium covering to spread the heat across the surface of the board as described below.

200 MICRONS – THICKEST ALUMINIUM FOR RAPID RESONSE

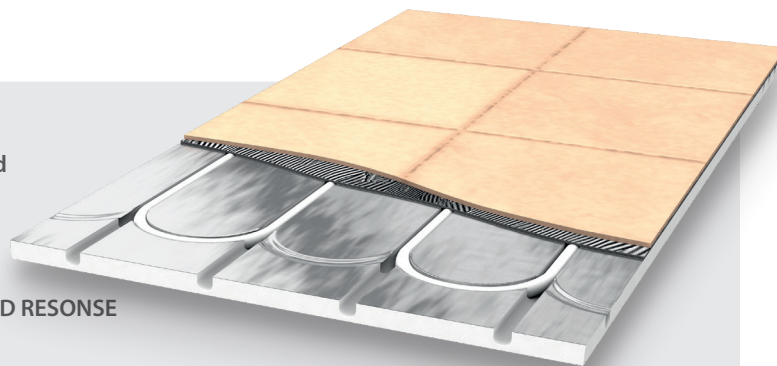
Quickest heat up time, fast even transfer of heat.

100 MICRONS – MEDIUM ALUMINIUM COVERING

Slower heat up time, slower to warm up evenly.

50 MICRONS – THINNEST ALUMINIUM COVERING

Slowest heat up time, slowest to heat up evenly.



BS EN 12667 - 2001

Wundatherm Premium+ Boards have been tried & tested in the Thermal Measurement Laboratory at the University of Salford, Manchester

Testing for thermal resistance for both 16mm & 20mm boards was carried out to ISO 8301:1991 / BS EN 12667 - 2001



You will need:

- Either Wunda board spray adhesive & mask
- Or Mapei Ultrabond ECO 380 & A2 spreader
- Work gloves
- Craft knife
- Metal straight edge rule
- Marker pen
- A flat & level structural subfloor

Also recommended:

- Router
- Fine tooth saw
- Knee protection
- Eye protection
- Aluminium tape
- Pipe Layout Drawing*
- Wunda recommended renovation screed (optional)

**Please speak with your account manager & ensure you are happy with the design prior to ordering your system.*

Floor preparation

1 **wundatherm boards** can be fixed to new or existing concrete/screed or wooden floors which must be flat, dry, level, stable & structural. Remove any loose paint or coverings. Floors must be free from oil, grease, damp, dust and debris or any other substances that will prevent the adhesive from adhering.

When fixing **wundatherm boards** to a concrete or screed floor, ensure a damp proof membrane has been installed, if not or unsure, then apply a liquid damp proof membrane and allow to cure fully before fixing any boards.

When fixing **wundatherm boards** onto a wooden/timber floor ensure any loose flooring is secured, replace any missing or damaged boards. Ensure the floor is firm and level, allow any adhesives to dry fully before fixing **wundatherm boards**.

If fixing **wundatherm boards** to a non-porous substrate such as existing tiles, they will need thorough cleaning with a de-greasing agent, such as scrubbing with a combination of methylated spirits and wire wool. Coat the tiles with Wunda spray adhesive first and then coat the back of the **wundatherm board** with Wunda spray adhesive, allow both to become tacky and then bring the two surfaces together. (Test a small patch first to ensure compatibility) **Please note:** this will half the coverage achieved with Wunda spray.

Fitting perimeter strip

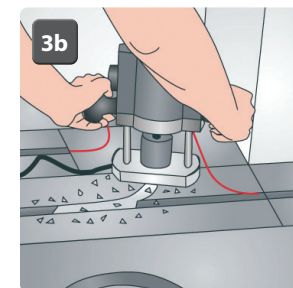
2 Before laying the floor heating boards, remove skirting boards and any doors that will require trimming to accommodate the floor heating boards and final floor finish (**2a**). Fit perimeter edge strip around the outside edges of the area to be heated using the sticky tape on the back or a hand staple gun. This will allow for expansion and help reduce heat loss (**2b**). Any height excess can be trimmed off once the final floor finish has been laid & skirting boards back down to cover. If intending to lay carpets with edge grippers, fix a suitably sized batten up to same height as the **wundatherm board** around the room perimeter. Lay the **wundatherm boards** flush against the batten when installing, this will allow fitment of carpet gripper at a later stage, with no risk of fixing through panel or pipe.



Cutting boards

3 Some cutting of boards will be required, this is easily achieved with a craft knife or fine toothed saw (**3a**).

Extra pipe channels and routes can be cut by hand or using an electric router with a 16 or 12mm bit depending on pipe diameter (**3b**).



Passing pipe through walls



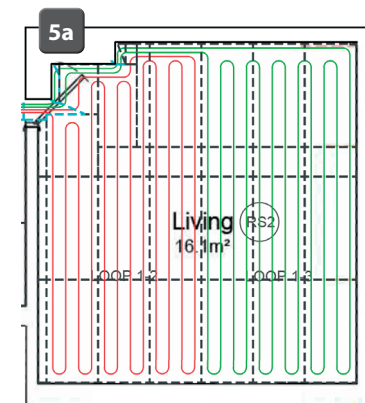
4 When floor heating pipes need to pass through walls, drill the holes before laying and fixing boards to prevent any damage to the boards. Protect and seal the pipe ends with tape. To prevent kinking, one person should feed the pipe through the hole whilst another draws the pipe through from the other side, it is a good idea to use pipe conduit to run through walls (**4a**).

Study the pipe layout drawing

5 Before attempting to lay any floor heating boards, familiarise yourself with the system layout drawing, noting manifold position. The drawing will detail the orientation and position of boards (**5a**) Plan the routes for transitional pipe runs and transitional boards.

Some cutting of boards will be required this is easily achieved with a fine toothed saw or craft knife. We advise wearing gloves as the aluminium edges can be sharp.

Please note: the pipe layout drawing is optional, please request one before ordering your system.



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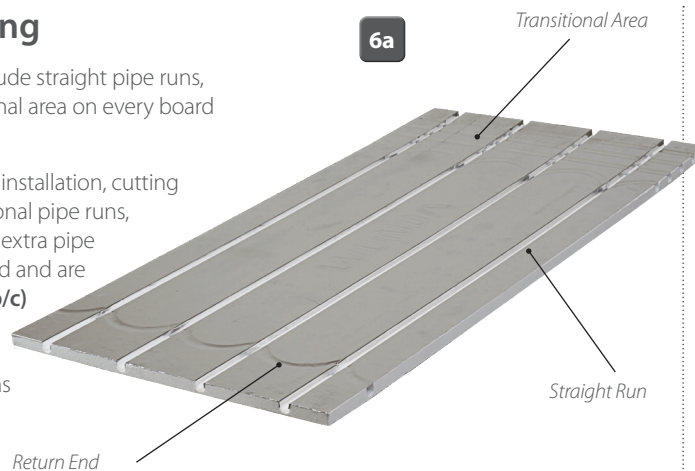
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Preparation & Cutting

6 **wundatherm boards** include straight pipe runs, return ends and a transitional area on every board (6a).

The boards are designed for easy installation, cutting to shape where required. Transitional pipe runs, additional corners, 90° bends and extra pipe channels will normally be required and are simply cut from a main board (6b/c). The main boards should be used in conjunction with Wunda transitional boards in areas of high pipe concentration.



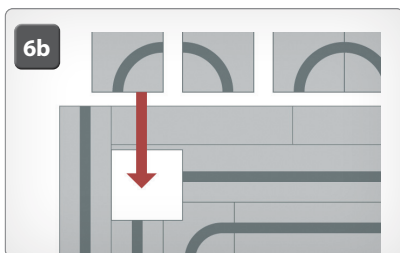
6a

Transitional Area

Straight Run

Return End

3



6b



6c



6d

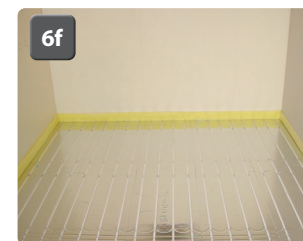
75mm

When cutting and creating new bends into a board, keep the radius gradual and no sharper than in a main board. The water flow around a pipe circuit should always go to potential cold areas first, for example external walls and areas of high glazing. We suggest wearing flat soled shoes or trainers whilst walking on the boards. Pipe should be set back from walls to limit heat loss into the wall and to avoid future placement of carpet grippers etc. (6d). Ensure boards are dry and free from dirt, dust or any other contaminants before laying. Keep any off-cuts as they may be required later on.

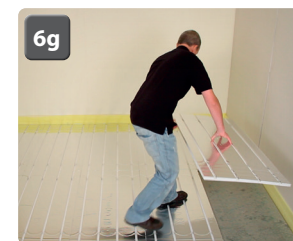
Before laying any boards, familiarise yourself with the system layout drawing noting direction of boards, potential cutting required and transitional areas. If you are inexperienced in laying **wundatherm** heating we strongly suggest completing a 'dry' lay of all boards before using any adhesive. Identify joins between boards using a marker pen (6e). Once you are satisfied that all boards have been cut and marked for an area (6f) they can be lifted in preparation of fixing the boards permanently in place (6g).



6e



6f



6g

Fixing wundatherm boards to an existing or new floor

7 Board spray adhesive method. Ensure subfloor is dry, clean, stable, level and free from oil, grease, loose paint and any obstructions. Secure any loose boards, fill any holes, dips or low points in the floor. When using Wunda spray adhesive users must be aware of the environment in which the spray is to be applied. The cans need to be at least 16°C for the spray to work. If cold please warm cans prior to use with warm water.

Ensure adequate ventilation, open windows and doors, do not use in confined areas. Wear suitable protective gloves, face mask and clothing. Prior to use, check compatibility, spray a small test patch onto the substrate. Some non-porous floors such as existing tiles will need thorough cleaning with a de-greasing agent such as scrubbing with a combination of methylated spirits and wire wool. Apply a coat of spray adhesive to the existing tile surface **and** the underside of the **wundatherm** board. Allow both surfaces to become tacky before bringing together (we recommend testing a small patch to test compatibility). Place the board carefully onto the adhesive, making sure you have selected the correct board and orientation. Apply an even and firm pressure, make sure the board is in full contact with the adhesive and floor below.

When using Wunda spray to fix **wundatherm boards** onto existing floor boards, both the floor boards and the underside of the **wundatherm board** will require a covering of Wunda spray adhesive*. This is necessary as coating both the floor boards and board will create maximum contact between the two surfaces giving a firm and secure fixing. As before, always carry out a test area with Wunda spray and board before commencing with the rest of the installation.

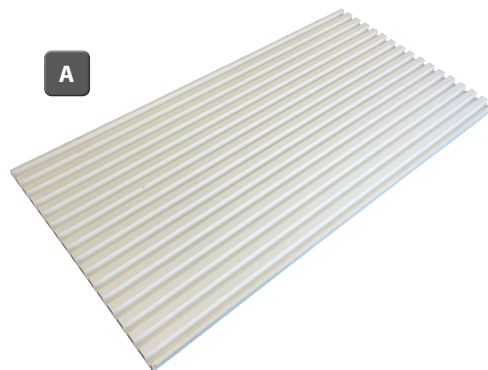
**This will half the coverage achieved with Wunda spray.*

Transitional areas

Wunda transitional boards (A) are easily cut to suit any **wundatherm** project where there is a concentration on pipes or where a corner needs to be formed.

Straight pipe runs can be laid directly into the straight transitional board – cut to length and width as required (B).

Traditional boards must be bonded to the sub-floor using our recommended adhesive.

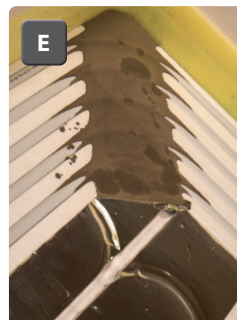
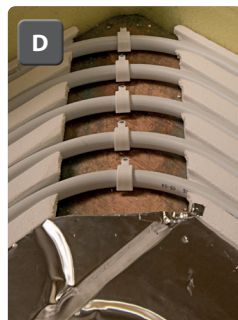


Do not push the 45° cut edges up against each other, leave a gap approximately 120mm wide (C) this will allow the pipe to be formed and bent as it changes direction from one straight channel to another. Take care not to form too tight a bend and kink the pipe. The open area between the boards can be back filled using one of our levelling screeds, either Mapei UltraPlan Renovation screed or Ultra Floor Level IT Two, taking care to follow the instruction on the packets.

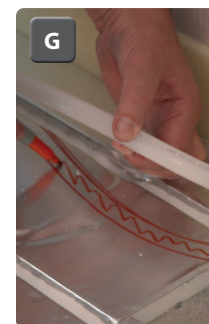
Apply and level off at the same height as the Overfloor board (D/E). Alternatively corners can be routed out from a main board once bonded to the floor.



Corners can be formed from a transitional board, for example cutting two opposite 45° will provide a 90° turn (C).



Extra pipe channels can easily be cut using a suitable router and bit. In order that a smooth bend is formed, lay and shape the pipe onto the area where the channel is required, gently bending the pipe to follow a gentle curve. Once the lay of pipe has been established, follow the curve with a marker pen, marking directly onto the board the route to be routed (F/G).



Using a router with bit set to 16/12mm depth depending on pipe, gently cut the new channel following the marker pen layout (H). Ensure the channel is clear and free from debris, if required the channel can be lined with aluminium tape. Lining with aluminium tape is not required in areas with highly concentrated/close floor heating pipes.



Where floor heating pipes are required to pass through walls, suitably sized holes will be required at floor level using an 18mm drill bit (J). Take care to avoid any services hidden within the wall, the end of the pipe must be taped off to ensure no debris enters the pipe **before** passing through the wall. When passing pipe through the wall, lift any **wundatherm** boards immediately before the hole, this will make it easier to pass the pipe through the wall and help prevent any kinks occurring. The area at entry and exit around the holes may require back filling with either off cuts of **wundatherm** board or back filled using one of our levelling screeds either Mapei UltraPlan Renovation screed or Ultra Floor Level IT Two, taking care to follow the instruction on the packets. Apply and level off at the same height as the **wundatherm** board. You may wish to use pipe conduit to protect the outer layer of the pipe when running through walls.

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PLEASE NOTE: Spray should be shaken well before use and kept above 16° for best results. If the spray splatters and comes out uneven, this is due to being stored in a cold environment - the adhesive should be gently warmed in warm water before use and periodically during use as the spray can temperature will gradually cool down.

Bonding boards using Wunda spray adhesive.

7 Wunda spray adhesive is designed specifically for quick and strong bonding of **wundatherm boards** to Concrete, Screed and Wood. Available in 500ml spray cans and 22ltr canisters for use with our hose and spray gun. 500ml spray cans will cover up to 5M² when applied to one surface, a 22ltr canister will cover up to 150M² when applied to one surface and has a 2 year shelf life.

When bonding the boards in place, we suggest starting in a corner and work along the furthest outside wall first, when you reach the opposite corner start a new row. Ensure that the pipe channels line up as you lay each board. A helpful tip is to mark around each board on to the floor with a marker pen before spraying adhesive. This will allow you to spray the adhesive right up to the edges minimising overspray and wastage **(7a)**.

Spray should be shaken well before use and kept above 16° for best results, if the spray splatters and comes out uneven this is due to being stored in a cold environment and the adhesive should be gently warmed in warm water before use and periodically during use as the spray can temperature will gradually cool down.

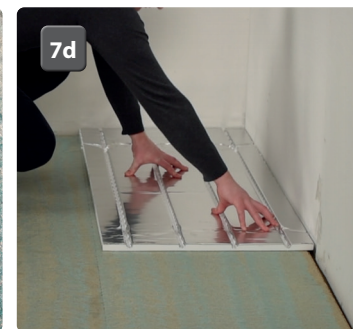
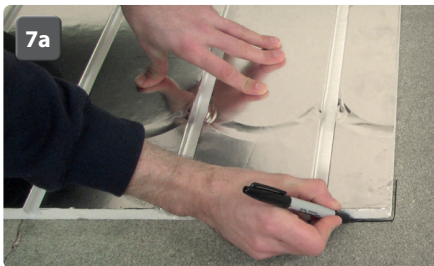
Spray at a distance of 10-20cm (4-8") towards the substrate surface, applying a uniform and even coat of adhesive and obtain **80-100%** coverage **(7b)**. Do not over apply the spray, overlap each pass of spray so as to create an even coat of adhesive. Release the spray at the end of each sweep so as to avoid puddles of adhesive – a good tip is to watch our online video 'Installing **wundatherm** boards with Wunda Spray Adhesive'. Allow the adhesive to tack off until no adhesive transfers to the knuckle when touched **(7c)** then position the board onto the adhesive, pressing down firmly to good contact with the adhesive **(7d)**.

Avoid over applying spray adhesive, as this is not necessary and will result in poor coverage results. Some subfloors may require a coat of adhesive to the subfloor and a perimeter coat around the underside of the **wundatherm board** (please note: this will reduce coverage). Always perform a small test area before commencing full installation and spray use.

Important: When bonding onto older floorboards

Make sure your existing floorboards are flat and in good condition.

Please replace any old boards and fix loose ones and ensure any screw or nail heads are below the surface of the wood.



NOTE: If using the 500ml spray can, the nozzle can be set to one of three positions - LOW, MEDIUM & HIGH, as indicated L, M, H on the raised area below the nozzle. We recommend setting the spray pattern between M & H.



Using Mapei Ultrabond Eco 380 to bond boards to the floor

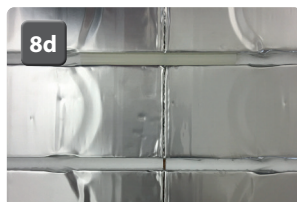
8 As an alternative to using Wunda spray adhesive, Mapei Ultrabond ECO 380 is approved. With a strong bond of **wundatherm** boards to all kinds of absorbent, stable, level substrates including concrete/screed and existing wooden floors, which must be flat, dry, level, stable & structural. Floors must be free from oil, grease, damp, paint and debris or any other substances that will prevent the adhesive from bonding to the floor. ECO 380 must be allowed to fully cure before any foot traffic or laying floor heating pipes.



Starting with a few square meters at a time apply Mapei Ultrabond ECO 380 to the substrate using a 2mm (A2) tooth comb spreader (**8a**). Do not use Mapei Ultrabond ECO 380 as a filler to level out gaps, cracks or uneven substrates as this will greatly reduce the coverage achieved and increase drying times, plus effecting the ability to **bond properly**. Any uneven screed or concrete floors should be levelled with a renovation screed first. Mapei recommend Ultraplan Renovation Screed for this.

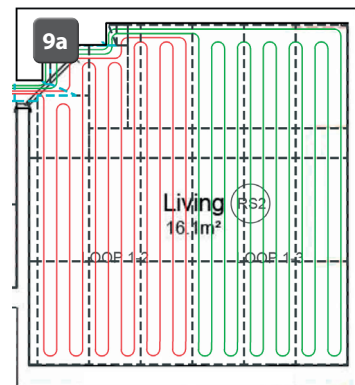
6

Leave the Mapei Ultrabond ECO 380 to become tacky before laying any boards – generally 10-30 minutes dependant on the substrate, environment conditions and temperature. The boards can now be applied to the adhesive, starting with one board at a time, usually the furthest corner of the room (**8b**). Systematically work across the outside wall fixing each board in turn (**8c**). When you reach the opposite side of the room return to the beginning and start the next row, ensuring that pipe channels line up.



A good tip is to insert a small off cut of pipe into the pipe channel where the boards meet (**8d**). After laying each board, carefully walk on the board applying adequate and even pressure, ensuring the board has taken to the adhesive. Take care as boards may slip on the adhesive, if any boards squeak when walked on, carefully lift the board, re-apply adhesive and repeat the above steps (**8a-8d**). Allow sufficient time for the Mapei Ultrabond ECO 380 to fully dry before allowing any foot traffic as boards may slip and move (generally 24-48 hours drying dependant on the substrate, environment conditions and temperature).

Installing floor heating pipe into wundatherm boards



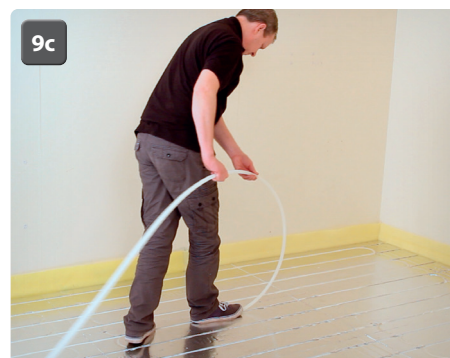
9 Before laying pipe make sure all pipe channels are clear from debris, check and familiarise yourself with the pipe layout drawing (**9a**), plan where to begin and the pipe routes for each individual loop of pipe.

The layout drawing will indicate the length of each pipe loop required. Do not cut the pipe before laying as you may need to change the route due to unforeseen circumstances.

Wunda Pert/Al/Pert pipe is recommended for use in all **wundatherm** systems due to it's flexible, lightweight and easy to handle properties. Always begin laying pipe at the manifold, allowing a bit extra for final connection to the manifold, identify each loop flow, return and loop number and loop length using a permanent marker (**9b**).



If not using a pipe decoiler the pipe can be easily installed by two people, the first walks with the pipe coil and reels it out while the second person carefully walks along the pipe pushing the pipe down into the straight pipe channel (**9c – 9d**).



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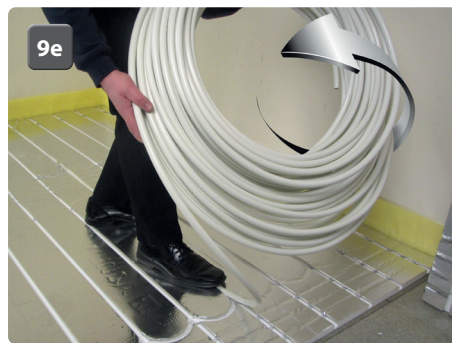
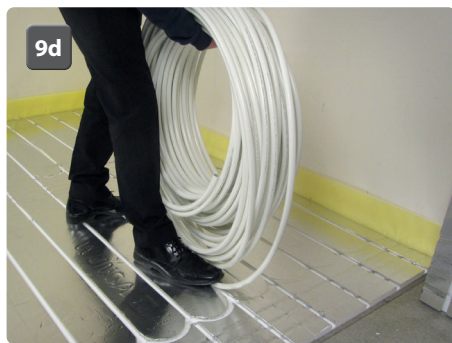
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If laying pipe without the aid of a pipe de-coiler, when you reach the end of a straight run, employ the technique of rotating the whole coil through 180° towards the direction of the return channel (9d/e)



7

This will help deter the pipe from trying to twist and keep tension pointing downwards, ease the pipe around and into the bend. Lay the pipe into the return or corner, gently forming and pushing the pipe into the channel as it works around the bend (9d/e).

Do not try and form the bend before laying the pipe as this could potentially result in a kink in the pipe. If a kink occurs, wrap the pipe in a warm wet cloth for protection and gently squeeze with pliers to re-shape. Alternatively the pipe can be lifted out of the boards and moved backwards so the kinked section now lays in a straight channel.

Once all pipe has been laid into the boards, ensure each loop has been identified with flow, return and loop number (9b). This will help eliminate mistakes when connecting the pipe to the manifold at a later stage. Protect your newly laid floor heating system from site traffic by covering with boards where walking is necessary prior to installation of final floor finish.

If pipe work is not installed correctly, it may sit proud of the **wundatherm** board, it can be tapped down using a wooden batten across the board and gently tapped with a hammer (9f) or aluminium tape can be used to secure the pipe.



TIP:

In the unlikely event of a kink in the pipe occurring, wrap the pipe in a warm wet cloth for protection and gently squeeze with pliers to re-shape. Be careful not to over work it and kink the other way. Pressure test as normal but investigate the kinked area prior to covering.

Wundatherm Premium+

Flooring with wood products (inc. Parquet, Solid and Laminate)

For floating Wooden and Laminate floors it is advisable to use Wunda XPS Underlay, allowing the floor to move freely when expanding and contracting and to help improve step noise reduction.

Wood is a material that is extremely influenced by its environment, specifically by moisture content of the air above and below. Depending on the relative humidity of the air, moisture content of the wood will naturally vary over the seasons – and so will its volume. Floor heating will escalate the expansion and contraction of wood. It is therefore extremely important to install wood flooring with care, **following the manufacturers guidelines**.

Flooring manufacturers often give instructions on how wood flooring should be laid, with a maximum surface temperature of 27°C. This can be monitored and set using a Wunda thermostat and floor probe which will protect the floor.

The easiest means of installing wooden flooring is by the 'floating floor' method, special attention must be taken to follow manufactures instructions on expansion joints. With Floor heating, wood will dry and shrink more during the winter season than if floor heating was not installed.

Generally for wood floating floors, it is important to have some form of vapour barrier underneath. Some wood flooring manufactures require a polythene vapour barrier (0.2mm thick and age tested) to prevent vapour moisture potentially coming from below which could damage the wood flooring.

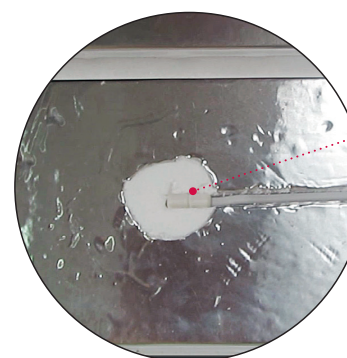
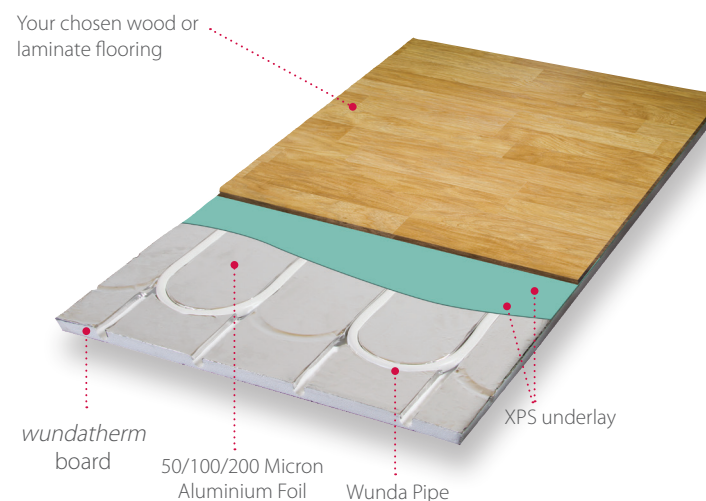
It is important for wood flooring which has been kept in cold conditions to be taken into the room in which it will be fitted, so that it can acclimatise to the new environment and this may take several weeks. Some large wood products (unless kiln dried) may need a longer acclimatisation period in order to dry to a sufficiently low moisture content before it can be fixed.

Again, check with your flooring supplier for the best practise.

Please note:

Maple and Beech woods are not suitable with underfloor heating due to potentially large seasonal movements of contraction and expansion in the woods causing splitting.

How the Overfloor board works with your chosen flooring



Floor Probe embedded in Wundatherm board

Please note:

When designing the UFH system try and keep grain of wood going at 90 degrees to the direction of the pipe to avoid the pipe running parallel with wood joins.

General recommendations for installing wood flooring

Flooring manufacturers give instructions on how wood flooring should be laid, and make reference to floor surface temperatures not exceeding 27°C. Wunda always recommends the use of thermostats with floor probes to limit floor surface temperatures. The maximum resistance of all floor coverings should not exceed 2 tog. or 0.2 m² K/W

Install the wood flooring on top of a suitable underlay, remembering to leave adequate space at the expansion joints for the wood to expand and contract over the seasons, usually the space is made available along adjacent walls so that the space will be covered by skirting boards on the wall.

Parquet

Parquet should be installed according to suppliers instructions. Parquets of a laminated type (three layers) give smaller expansion and contraction over the seasons. Solid parquets have larger moisture movements than laminated parquets. With small form factor blocks, we recommend a renovation screed as an intermediate layer, either Mapei or Ultra (Premium+ Boards only, see pg 10 & 11).

9

Solid wood (floorboards)

Solid floorboards should be placed so that the direction of the grain is at 90 degrees to the direction of the pipe. If the floorboards are to be fixed rather than a floating floor, suitable advice should be available from your supplier, however fixing with an acrylic adhesive will allow for expansion and contraction of floorboards over the system.

Laminate

Laminates are usually quite thin (7 - 10mm), which from an energy perspective are more efficient than other thicker wood floorings. They should either be glued or 'clicked' together according to the manufacturers instructions. Several laminates are delivered with a vapour barrier and/or an acoustic layer attached to the bottom.

Carpet

If intending to lay carpets with edge grippers, fix a suitable sized batten around the perimeter of the room up to the same height as the **wundatherm** board, this will allow fitment of carpet gripper at a later stage.

Carpet will require a flat surface, you can use our duoboard system (see factsheet U04) No more than 2 tog 0.2m² K/W of resistance for underlay and carpet when using Duo Board. For Renovation Screed as an intermediate layer (for Wundatherm Premium+ boards only) gives 2.5 tog 0.25m² K/W resistance for carpet & underlay combined.

Alternatively:-

Prime the aluminium and exposed floor heating pipes of the **Wundatherm Premium+** boards with MAPEI ECO-PRIM GRIP and once dry a minimum 5mm depth of MAPEI ULTRAPLAN RENOVATION SCREED to form a solid and level surface for the carpet.
Or, prime with ULTRA PRIME IT, followed by 5mm of LEVEL IT 2.

Karndean, Amtico, Cork Planks

Prime the aluminium and exposed floor heating pipes of the **Wundatherm Premium+** boards with MAPEI ECO-PRIM GRIP and once dry a minimum 5mm depth of MAPEI ULTRAPLAN RENOVATION SCREED to form a solid and level surface for your final floor finish. Or, prime with ULTRA PRIME IT, followed by 5mm of LEVEL IT 2. Please see pages 10 & 11 for full instructions on using Ultra products.



Installation guide for using Ultra products with Wundatherm Premium+ High Density Overfloor Heating Boards

Wundatherm Overfloor Heating Boards are a range of underfloor heating systems with pre-cut channels that house warm water pipes and are suitable for use over a variety of existing floors. The range consists of boards made from expanded polystyrene (EPS) of low, medium and high density. The more dense the board the greater its strength and insulating properties. Only Premium+ is suitable for renovation screed/heavier floor finishes.

The upper surface of the boards have a bonded layer of aluminium foil to aid dispersion of the heat rapidly across the floor. Please see separate information for installing Carpet, Vinyl & Linoleum Sheet, Solid Wood (Floorboards), Parquet, Laminate Flooring direct to Wundatherm or in combination with Wunda Duo-Boards as specified.

The following guidance is specific to using Instamatic UltraFloor & UltraTilefix materials with Wundatherm Premium+ High Density Board.

- Installing Ceramic, Porcelain, Quarry & Natural Stone Tiles.
- Installing Carpet Tiles, LVT, Vinyl Tiles & Planks

PREPARATION

Once the warm water pipes have been fitted to the Wundatherm Overfloor Boards, the following criteria must be checked and assured before continuing:

1. Ensure that the Wundatherm Premium+ Boards are secured to the substrate and that there is no movement in the boards. It is essential to the performance of any cementitious products, to be installed, that the boards are solid and stable in position and firmly fixed. Movement of the boards will need to be rectified before continuing as this may lead to cracking or de-bonding of the next course of materials.
2. It is essential that the under floor heating is pressure tested to ensure no leaks are evident in the pipework and the system is working as required. Once confirmed, the heating should remain switched off for the duration of the flooring installation.
3. Under no circumstances should the floor heating be used to aid the drying of any cementitious levelling or adhesive compounds to be used. Force drying in this way is likely to affect the hydration process of the cement, reducing its strength and overall performance.
4. Any pipes rising out of the channels should be firmly reset. All pipes need to be firmly fixed into the board channels before continuing.

5. Once steps 1 to 4 are completed, it is essential that any unused channels bridged with foil should be broken through and the foil edges pressed firmly into the walls of the channels. This is to prevent unsupported weak spots in the finished flooring being susceptible to point loading.
6. Vacuum the complete surface ensuring all debris has been removed from the boards, pipes and broken through channels.
7. Once clean, we recommend priming the entire surface with a neat application of UltraFloor Prime it MSP. Would recommend the use of a paintbrush to coat the pipes and empty channels thoroughly, followed by a roller to coat the board across the entire foil surface. Avoid thick sections or pooling of primer in channels and around pipes that will only serve to delay drying.
8. Ensure the primer is fully dry before continuing; typically, this is within 2 hours but is dependent on temperature conditions and application thickness. It is essential that all exposed surface including unused channels and pipes are primed thoroughly and are dry before continuing.



Tiling to Wundatherm Premium+ (Ceramic, Porcelain, Quarry, Natural Stone)

Option 1. (Minimum tile size 10cm x 10cm)

- a. Use a straight sided trowel to apply UltraTilefix ProFlex S2 tile adhesive to the prepared boards to fill in the unused channels (see note 5) or any deep sections cut outs in the boards.
- b. Whilst still wet apply the same adhesive using a rounded notch floor trowel to suit the installation, over the complete surface. Bed tiles immediately. Pressure applied to the tile should be sufficient to create 100% contact of the adhesive with the back of the tile.
- c. Ensure that if using large format tiles (tile with at least one side 300mm or greater) that the back of the tile is also back buttered with the adhesive to ensure there is 100% contact creating a secure bond.
- d. Once cured (24 - 48hrs dependent on conditions) use UltraTilefix ProGrout Flexible to grout the joint to complete the installation.
- e. On completion of installation of tiles and after grouting has cured hard, the floor should remain at ambient temperature for a minimum of 7 days with the underfloor heating pipes switched off. After this period, the water heating temperature is increased gradually to reach working temperature slowly. A maximum rate of temperature increase would 5°C per day is recommended. Failure to follow this instruction could damage the installation.



Option 2. (All tile sizes)

- Apply UltraFloor Level it Two to the prepared boards ensuring a minimum depth of 5mm above the top of the heating pipes. To ensure maximum flow properties ensure the leveller is mixed for 3 minutes before pouring.
- Ensure all unused channels & pipe sections are filled with the compound initially.
- Allow the leveller to cure for 48 hrs before considering tiling over.
- When cured apply UltraTilefix ProFlex S2 tile adhesive to the leveller using a rounded notch floor trowel to suit the installation. Bed tiles immediately. Pressure applied to the tile should be sufficient to create 100% contact of the adhesive with the back of the tile.
- Ensure that if using large format tiles (tile with at least one side 300mm or greater) that the back of the tile is also back buttered with the adhesive to ensure there is 100% contact creating a secure bond.
- Once cured (24 - 48hrs dependent on conditions) use UltraTilefix ProGrout Flexible to grout the joint to complete the installation.



NB: If installing Option 2 in a bathroom, shower room or wet room area then it is advisable to include a waterproofing system between stages (c) and (d). Ultra TileFix ProShield Tanking Kit can be used provide waterproofing protection, dependent on the floor design.

- On completion of installation of tiles and after grouting has cured hard, the floor should remain at ambient temperature for a minimum of 7 days with the underfloor heating pipes switched off. After this period, the water heating temperature is increased gradually to reach working temperature slowly. A maximum rate of temperature increase would 5°C per day is recommended. Failure to follow this instruction could damage the installation.

Preparing Wundatherm Premium+ boards before laying Carpet Tiles, LVT, Vinyl Tile & Planks

- Apply UltraFloor Level it Two to the prepared boards ensuring a minimum depth of 5mm above the top of the heating pipes. To ensure maximum flow properties ensure the leveller is mixed for 3 minutes before pouring.
- Ensure all unused channels & pipe sections are filled with the compound initially.
- Allow the leveller to cure for 48 hrs before considering installing floor covering.
- Install floor covering as per manufacturer's recommendations.
- On completion of installation of the final floor covering, the floor should remain at ambient temperature for a minimum of 7 days with the underfloor heating pipes switched off. After this period, the water heating temperature is increased gradually to reach working temperature slowly. A maximum rate of temperature increase would 5°C per day is recommended. Failure to follow this instruction could damage the installation.

Precautions:

- Prior to installing **Wundatherm Premium+ Boards**, the floor should be level, in order that the boards sit flat and are fully supported. This will also ensure 100% contact of the board into adhesive. Any uneven areas need to be levelled before starting.
- Whether pre-levelling the existing floor or applying board adhesive direct, all dirt, debris, grease or contamination should be removed thoroughly and the complete floor area vacuumed to ensure clean and dust free. Do not sweep using brush or broom, this will only serve to spread the dust.
- Any loose or flaking floor paint, should be mechanically scarified to remove.
- If moisture exists in the original screed then this needs to be rectified before installation of the Wundatherm System. Please see potential use of UltraFloor DPM IT Rapid Cure.

Wundatherm Premium+ & Mapei guide for tiling using Mapei adhesives

In all circumstances the board must have been installed correctly and provide a sound, stable substrate. Additionally it must be clean and free from contamination or substances which could inhibit adhesion. To reduce consumption of Renovation Screed/Tile Adhesives, it is advised that any unused pipe channels are covered/filled with e.g. left over pipe and any gaps taped over.

Installing ceramic, vitrified, quarry and porcelain tiles

- Option 1**
- Bond tiles directly to the Wundatherm Premium+ Boards with MAPEI KERABOND T & ISOLASTIC (100%)
- Option 2**
- Prime the Wundatherm Premium+ Boards with MAPEI ECO PRIM GRIP.
 - Level with a minimum 5mm MAPEI ULTRAPLAN RENOVATION SCREED*
 - Bond tiles using MAPEI KERABOND T & MAPEI ISOLASTIC (100%)

Installing natural stone tiles

- Option 1**
- Prime the aluminium surface with MAPEI ECO PRIM GRIP
 - Level with min. 5mm MAPEI ULTRAPLAN RENOVATION SCREED*
 - Bond tiles using MAPEI KERABOND T & MAPEI ISOLASTIC (100%) or MAPEI ELASTORAPID or MAPEI GRANIRAPID.

Installing ceramic, porcelain & natural stone tiles in a wet room

STAGE 1

- Option 1**
- Prime the aluminium surface with MAPEI ECO PRIM GRIP
 - Level with min. 5mm MAPEI ULTRAPLAN RENOVATION SCREED*

STAGE 2

- Waterproofing**
- Apply MAPEI MAPELASTIC AQUADEFENCE/MAPEI MAPEBAND
- Fix Tiles**
- Bond the tiles with MAPEI KERABOND T & MAPEI ISOLASTIC (100%) or MAPEI ELASTORAPID

Mapei products overview

Ultrabond Eco 380

Ultrabond Eco 380 is an adhesive with a quick and strong bond of wundatherm boards to all kinds of absorbent and stable substrates used in the building industry including screed/concrete and existing floorboards



Ultraplan Renovation Screed - to provide a level surface to accept floor tiles.

Ultraplan Renovation Screed is a fibre reinforced self levelling compound suitable for applying onto Wunda Overfloor boards after first priming the Overfloor Board with **Mapei Eco Prim Grip**.

A minimum 5mm screed is required

* Do not introduce any heat into the pipe circuit until renovation screed has fully cured.



Ultrabond Eco S955 1K

Ultrabond Eco S955 1K is used for bonding a ply deck or bonded wood finish directly on to wundatherm boards.



Kerabond T and Isolastic

Kerabond T and Isolastic is a two part mix (Ratio 100 : 33, Kerabond : Isolastic) used to bond tiles directly to wundatherm boards (used for laying of ceramic, vitrified, quarry and porcelain tiles). **Drying time** - allow 7 days before introducing heat gradually.



Mapei Aquadefence and Mapeband

Mapei Aquadefence is a ready to use, flexible, ultra rapid drying waterproofing membrane for use in wet rooms. **Mapeband** is an Alkali-resistant rubber tape with textile backing/edges for the flexible waterproofing of edges and expansion joints. Used with MAPELASTIC AQUADEFENCE.



Under NO circumstances should the floor heating be used to aid or speed up the drying of any floor heating board adhesives or tile adhesives including grout. When heating the system for the first time, ensure any heat is introduced gradually to protect the floor from thermal shock.

Technical Information

Wundatherm Premium+ Overfloor Boards	20mm	16mm
Length	1200mm	1200mm
Width	600mm	600mm
EPS Density	116 kg/m ³	110.2 kg/m ³
Compressive Strength	400 kPa	400 kPa
Board weight	1.59 kg	1.33 kg/m ³
External Diameter of Pipe	16mm	12mm
Thermal Resistance	0.447 m ² k/w +/- 2.5%	0.379 m ² k/w +/- 2.8%

Please note: Advised maximum lengths for individual pipe circuits is 100 linear metres for 16mm pipe and 60 linear metres for 12mm pipe.

Important Information

The heat output of this underfloor heating system must be limited to a maximum supply water temperature of 45°C and a maximum floor surface temperature of 27°C for wooden floors. Underfloor heating cannot compensate for large heat losses of an inadequately insulated house. Please note that underfloor heating systems can give an approximate heat output of 96.5W/m² with ceramic and stone tile coverings and 65.3W/m² with wooden coverings (up to 16mm thick) and 51.5W/m² with carpet.

Outputs in line with BSEN 1264

"When mixed floor solutions are being served from the same manifold, a floor probe must be used in the floor solution with the lower maximum supply temperature. This is to limit the temperature in these floor areas and prevent damage to the floor solution and/or floor finish."

Please check our website for tech support videos

All wundatherm Overfloor Boards have a choice of 3 thicknesses of aluminium covering to spread the heat across the surface of the board as described below.

200 MICRONS – THICKEST ALUMINIUM FOR RAPID RESONSE

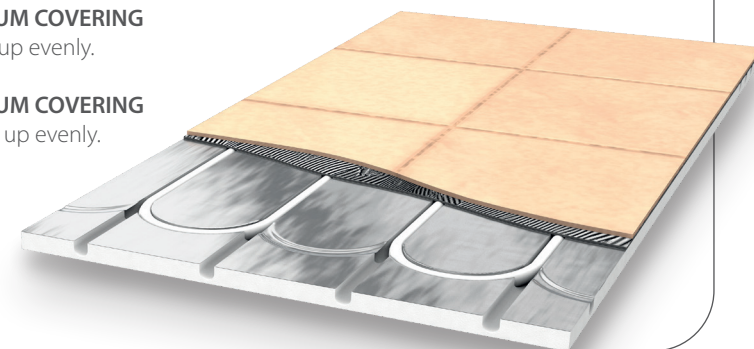
Quickest heat up time, fast even transfer of heat.

100 MICRONS – MEDIUM ALUMINIUM COVERING

Slower heat up time, slower to warm up evenly.

50 MICRONS – THINNEST ALUMINIUM COVERING

Slowest heat up time, slowest to heat up evenly.



Issued by:

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**University of
Salford**
MANCHESTER

Your Order No.: WT THERM/RES2019

Date of Issue: 19 November 2019

Signed:

Dr. A Simpson
Head of Laboratory

Approved:

Mr. I G Rattigan
Quality Manager

Thermal Resistance of Wundatherm Premium + 20mm

Client Wundagroup Plc, Castlegate Business Park, Caldicot, Monmouthshire, NP26 5AD.

- 1. Sample*** Miscellaneous Product supplied and identified by the client as "Wundatherm Premium + 20mm" was received by the Thermal Measurement Laboratory on the 5 November 2019. This was conditioned at 23°C and 50% RH for 5 days to constant mass then before testing.
Product Standard: Not Applicable
- 2. Method** LaserComp FOX 603 Instrument, single specimen heat flow meter apparatus, located in the Thermal Measurement Laboratory
Heat flow meter method to ISO 8301:1991 / BS EN 12667:2001
Serial Number: 12051473-F603
Heat flux direction: Vertically downwards
Edge heat losses minimised by additional edge temperature controls.
All temperature, dimensional and heat flow measurements are traceable to national standards.

3. Thermal Resistance

Mean Temperature [°C]	Thermal Resistance [m ² K/W]	Apparent Thermal Conductivity [W/mK]	Mean Measured Thickness [mm]	Density [kg/m ³]
21.0	0.447 ± 2.5%	0.0450 ± 2.5%	20.12	110.2

The results only apply to the sample tested as described in this report.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

4. Test Details

Measured specimen thickness:	0.02012	m
Relative thickness change during test:	0.00	%
Dimensions:	0.602×0.602	m
Relative volume change during test:	0.00	%
Mass before test:	803.7	g
Mass after test:	803.7	g
Relative mass change during test:	0.00	%
Relative mass change during drying:	N/A	%
Relative mass change during conditioning:	-0.09	%
Density of conditioned material as tested:	110.2	kg/m ³
Mean temperature of test:	21.0	°C
Average temperature drop across specimens:	11.92	°C
Density of heat flow rate:	26.680	W/m ²
Test started:	11 November 2019 at 08:55	
Test finished:	12 November 2019 at 08:28	
Duration of test:	23.55	hours
Ambient temperature surrounding the apparatus during the test:	22	°C
Type and pressure of gas surrounding specimens:	Air at atmospheric pressure	
Interface medium:	None	
Water-tight envelope:	None	

5. Date of Last Heat Flow Meter Calibration Check

The heat flow meter calibration was checked on 30 October 2019 using Item 2) and found to be within specification.

Calibrations are used that are based on:

- 1) Stable, aged greater than 25 years; 100mm EPS with thermal resistance at 10°C of 2.82m²K/W, which was last calibrated in the University of Salford UKAS accredited guarded hotplate during the current year.
- 2) 34mm IRM-440 Resin Bonded Glass Fibre Board, ID No: S312 with thermal resistance at 10°C of 1.13m²/K/W. Last calibrated at IRMM. Valid from July 2014 and is due to be recalibrated in July 2024

6. Thickness Measurement

The mean measured thickness was determined by the FOX 603 Instrument by measuring the hot and cold plate separation at each corner. The separation was checked with calibrated electronic calipers.

7. Specimen preparation and method of conditioning

Miscellaneous Product supplied and identified by the client as "Wundatherm Premium + 20mm" was received by the Thermal Measurement Laboratory on the 5 November 2019. This was conditioned at 23°C and 50% RH for 5 days to constant mass then before testing.

8. Errors in measured property

The maximum expected error in the measured Thermal Resistance is within 2.5%. This includes errors arising from non-compliances.

9. Non-compliances

The test conformed to the requirements of Standard Test Method ISO 8301:1991 / BS EN 12667.

10. Name of Test Operator/s

Dr. A Simpson, Head of Laboratory

11. Management system requirements of ISO/IEC 17025:2005

The laboratory operates a management system which meets both the technical competence requirements and management system requirements of ISO/IEC 17025:2005 that are necessary for the laboratory to constantly deliver technically valid test results within its accredited scope.

*** Sample Retention Period - Unless advised otherwise by the client, samples will be retained for up to 1month from the test completion date. After this time the samples will be destroyed.**

Issued by:

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**University of
Salford**
MANCHESTER

Your Order No.: WT THERM/RES2019

Date of Issue: 19 November 2019

Signed:

Dr. A Simpson
Head of Laboratory

Approved:

Mr. I G Rattigan
Quality Manager

Thermal Resistance of Wundatherm Premium + 16mm

Client Wundagroup Plc, Castlegate Business Park, Caldicot, Monmouthshire, NP26 5AD.

- 1. Sample*** Miscellaneous Product supplied and identified by the client as "Wundatherm Premium + 16mm" was received by the Thermal Measurement Laboratory on the 5 November 2019. This was conditioned at 23°C and 50% RH for 6 days to constant mass then before testing.
Product Standard: Not Applicable
- 2. Method** LaserComp FOX 603 Instrument, single specimen heat flow meter apparatus, located in the Thermal Measurement Laboratory
Heat flow meter method to ISO 8301:1991 / BS EN 12667:2001
Serial Number: 12051473-F603
Heat flux direction: Vertically downwards
Edge heat losses minimised by additional edge temperature controls.
All temperature, dimensional and heat flow measurements are traceable to national standards.

3. Thermal Resistance

Mean Temperature [°C]	Thermal Resistance [m ² K/W]	Apparent Thermal Conductivity [W/mK]	Mean Measured Thickness [mm]	Density [kg/m ³]
21.0	0.379 ± 2.8%	0.0433 ± 2.8%	16.43	116.0

The results only apply to the sample tested as described in this report.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

4. Test Details

Measured specimen thickness:	0.01643	m
Relative thickness change during test:	0.00	%
Dimensions:	0.602 × 0.602	m
Relative volume change during test:	0.00	%
Mass before test:	690.5	g
Mass after test:	690.6	g
Relative mass change during test:	0.01	%
Relative mass change during drying:	N/A	%
Relative mass change during conditioning:	-0.07	%
Density of conditioned material as tested:	116.0	kg/m ³
Mean temperature of test:	21.0	°C
Average temperature drop across specimens:	12.03	°C
Density of heat flow rate:	31.738	W/m ²
Test started:	12 November 2019 at 08:58	
Test finished:	13 November 2019 at 09:07	
Duration of test:	24.15	hours
Ambient temperature surrounding the apparatus during the test:	22	°C
Type and pressure of gas surrounding specimens:	Air at atmospheric pressure	
Interface medium:	None	
Water-tight envelope:	None	

5. Date of Last Heat Flow Meter Calibration Check

The heat flow meter calibration was checked on 30 October 2019 using Item 2) and found to be within specification.

Calibrations are used that are based on:

- 1) Stable, aged greater than 25 years; 100mm EPS with thermal resistance at 10°C of 2.82m²K/W, which was last calibrated in the University of Salford UKAS accredited guarded hotplate during the current year.
- 2) 34mm IRM-440 Resin Bonded Glass Fibre Board, ID No: S312 with thermal resistance at 10°C of 1.13m²/K/W. Last calibrated at IRMM. Valid from July 2014 and is due to be recalibrated in July 2024

6. Thickness Measurement

The mean measured thickness was determined by the FOX 603 Instrument by measuring the hot and cold plate separation at each corner. The separation was checked with calibrated electronic calipers.

7. Specimen preparation and method of conditioning

Miscellaneous Product supplied and identified by the client as "Wundatherm Premium + 16mm" was received by the Thermal Measurement Laboratory on the 5 November 2019. This was conditioned at 23°C and 50% RH for 6 days to constant mass then before testing.

8. Errors in measured property

The maximum expected error in the measured Thermal Resistance is within 2.8%. This includes errors arising from non-compliances.

9. Non-compliances

The test conformed to the requirements of Standard Test Method ISO 8301:1991 / BS EN 12667, with the exception of the following additional uncertainty:

- An additional uncertainty has been applied to allow for the thickness (non-parallelism) of the sample being 1.23% greater than the maximum 2% of the average thickness.

10. Name of Test Operator/s

Dr. A Simpson, Head of Laboratory

11. Management system requirements of ISO/IEC 17025:2005

The laboratory operates a management system which meets both the technical competence requirements and management system requirements of ISO/IEC 17025:2005 that are necessary for the laboratory to constantly deliver technically valid test results within its accredited scope.

*** Sample Retention Period - Unless advised otherwise by the client, samples will be retained for up to 1month from the test completion date. After this time the samples will be destroyed.**