

5 Description

Sealing Web

10 The invention relates to a sealing web for a region of a structure, such as a roof, cladding, cellar or tank, the sealing web consists of outer layers which contain a base polymer such as polyvinyl chloride or a polyvinyl chloride copolymer, and a plasticiser, as well as a combination carrier insert which contains a glass nonwoven mat. As the glass reinforcement can consist of woven cloth, scrim, knitted cloth or combinations thereof, the combination carrier insert can therefore also
15 be referred to as a mesh-fleece-composite, scrim-fleece-composite, woven-fleece-composite.

A similar sealing web can be found under WO 2009/138314 A1. To achieve ease of application, high impact strength at low temperatures and high weather resistance, the plasticiser is
20 to be a polymer plasticiser in the form of an adipic acid polyester with a mean molecular weight of 3,000 to 12,000. However, polymer plasticisers have considerable disadvantages in terms of application and cost.

25 The invention at hand is based on the task of further developing a sealing web of the type mentioned above in such a way that it can be produced cost-effectively, has high

dimensional stability and low shrinkage characteristics. A problem-free mechanical attachment should be made possible.

A further aspect is that the sealing web should have an extremely smooth or slightly embossed
5 surface.

Also, recycling should be better or easier compared to webs with polyester reinforcement.

10 In order to solve one or more of the abovementioned aspects, the invention essentially provides that the plasticiser is a low-molecular-weight plasticiser of which the proportion in the outer layers containing the base polymer is in each case between 25 wt.% and 45 wt.%, in particular, between 25 wt.% and 37 wt.%, more preferably however, between 27 wt.% and 35 wt.%, respectively.

15 In particular, it is intended that the combination carrier insert contains at least one glass reinforcement from the group: glass cloth, glass scrim, glass mesh or any combination thereof.

A glass mesh or glass reinforcement can consist of woven cloth, scrim, knitted cloth or
20 combinations thereof. Alternative terms for the named combination carrier insert can include mesh-fleece-composite, scrim-fleece-composite, woven-fleece-composite.

The difference between woven cloth and scrim is that woven cloth has a wavy fibre alignment and scrim has straight fibre alignment. Scrim can be single-layered or multi-layered. The fibres in
25 scrim are not interwoven.

To solve one or more of the aforementioned aspects, the invention proposes, in particular, a multi-layer sealing web for construction areas such as roofs, cladding, cellars or tanks, the sealing
30 web has outer layers which contain a base polymer such as polyvinyl chloride or a polyvinyl chloride copolymer as well as a low-molecular-weight plasticiser, also a glass scrim, glass cloth or glass mesh consisting of a glass nonwoven mat as well as glass scrim with fibres running in lengthwise/longitudinal direction and crosswise/transverse direction in a sheet structure
35 consisting of one or more layers of straight fibres aligned parallel.

The fibres are usually secured at the cross points - the securing takes place either by material closure or mechanically by frictional connection and/or form closure (positive locking).

The following types of fibre orientation are possible:

- 5 • monoaxial or unidirectional, resulting from the fixation of a set of parallel fibres.
- Biaxial, in which two sets of parallel fibres are fixed in the direction of two axes, multiaxial, in which several sets of parallel fibres are fixed in the direction of different axes.

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The invention proposes a multi-layered sealing web. An inner layer is formed by the combination carrier insert. As this consists of a glass nonwoven mat and glass cloth, glass scrim or glass mesh, the result is a problem-free secure mechanical attachment. At the same time, sufficient dimensional stability is achieved. Shrinkage due to ageing is reduced in comparison to known

15 roofing webs.

The invention also envisages that in particular, the glass reinforcement, such as the glass cloth, glass scrim or glass mesh, will be joined to the glass nonwoven mat using styrene-butadiene.

- 20 Starting with the outer layers, which should be based on PVC-P, SB binding agents are used, which deviates from expert's common way of thinking. The interaction or migration of volatile or liquid components from the PVC-P based outer layer, e.g. plasticisers, ESO, etc., with the SB binder used in the combination carrier insert, can have a negative impact on the properties of the binding
- 25 agent. Even if the use of styrene-butadiene means that the fibres of the glass reinforcement separate from the adjacent layers, the advantage is that higher wind suction forces are required to loosen the sealing web, as the attachment of the sealing web does not act as a unit made up of many fibre strands, but instead as several fibres, which means that greater wind
- 30 suction forces are required to loosen the sealing web.

It is possible to join the glass reinforcement, like the glass cloth, glass scrim or glass mesh with the glass nonwoven mat using acrylate or PVC-based variants such as PVC dispersions and PVC plastisols.

In contrast to existing sealing webs, a low-molecular-weight plasticiser, i.e. a monomer plasticiser, is used in the outer layers.

- 5 This results in high dimensional stability, low shrinkage and, in particular, the desired smooth outer structure. If there is only one outer layer running along the combination carrier insert, this means that, particularly on the side not being affixed, there is an intermediate layer creating the following order: outer-layer, combination carrier insert, intermediate layer, outer layer.
- 10 The composition of the intermediate layer is very similar to that of the outer layers. Differences may arise as a result of different additives, particularly with regards to UV stability and colour pigments, however, the intermediate layer may contain fewer additives than the adjacent outer layer.

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It is preferable if the low-molecular-weight plasticiser is a phthalate-based plasticiser, in particular, a plasticiser from the group DPHP (Dipropyl heptyl phthalate) DINP (Diisonyl phthalate), DIDP (Diisodecyl phthalate). The plasticiser can also be a phthalate-free plasticiser, a biobased

- 20 plasticiser or a partially bio-based plasticiser as described in EP3156447.

A combination of the above plasticisers may also be an option in a further development of the invention.

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A special characteristic of the invention is that each layer contains or consists of wt.%:

low-molecular-weight plasticiser	25 - 45, in particular, 27 - 37
Processing additives such as lubricants	0 – 1.9, in particular, 0.1 – 1.50
Filler such as calcium carbonate	0 -20, in particular, 0 - 15
PVC	45 – 57, in particular, 46 - 56
Antioxidant	0 – 0.2, in particular, 0.1 – 0.2
UV stabiliser	0 – 0.23, in particular, 0.1 – 0.23

Other stabilisers	1.5 – 1.8
Colour pigments except TiO ₂	0 – 0.14, in particular, 0.005 – 0.10
Titanium dioxide	1.0 – 12, in particular, 1 – 8
Flame retardant additives	0 – 20, in particular, 0 – 12

Other stabilisers could include organic thermo-stabilisers. The use of such stabilisers has the advantage that ESO or ESBO (epoxidised soybean oil) is no longer required in the composition as a co-stabiliser.

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The combination carrier insert is impregnated with the binding agent which ensures its connectivity to the adjacent outer-layers or rather outer and intermediate layers. It is preferable, that the binding agent is based on at least one substance from the group: styrene-butadiene, acrylate, EVA and PVC or combinations thereof. The PVC variant is particularly suitable as a

10 dispersion or plastisol.

In particular, styrene-butadiene is recommended as a binding agent, which despite absorbing plasticisers, does not display any adverse effects on the sealing web, not even in the area of the nodes of the intersecting glass fibres. Also, the mineral properties make it easier to recycle

15 compared to polyester.

The use of EVA, PVC, acrylate provides the advantage of exceptionally high adhesive strength between the combination carrier insert and the adjacent layers.

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Using the combination carrier insert as reinforcement has surprisingly resulted in the sealing web having an extremely smooth surface.

25 In addition, by using the aforementioned combination carrier insert, tensile stresses were able to be eliminated in the end product. This leads to stable thickness tolerances of the individual layers, enabling the manufacturer to achieve tighter thickness tolerances between the individual layers.

Exceptional high strength and easy attachment can be achieved when the glass nonwoven mat has a weight per unit area between 20 g/m² and 90 g/m² and/or the glass fibres of the glass nonwoven mat have a thickness between 10 µm and 20µm.

- 5 The strand spacing, mesh width or strand structure of the fibreglass cloth, fibreglass scrim or fibreglass mesh should be between 2x2 and 6x6 or combinations thereof, although it would be preferable to select 3x3 - 4x4. 2x2 means that per cm, two glass strands are laid both in lengthwise and crosswise direction. Warp strand is the name given to fibres going in lengthwise direction
- 10 and weft/fill strand for fibres going in the crosswise direction. The same goes for 3x3, 4x4, 5x5 and 6x6.

The structure or construction or strand spacing, or mesh width can be symmetrical, square, rectangular or asymmetrical. The following examples are intended to illustrate the various

15 structures:

- a square structure e.g. 2x2, i.e. 2 strands/cm in lengthwise and crosswise direction, 2 warp strands/cm and 2 weft strands/cm
- a rectangular structure would be for example 2x1, i.e. 1 strand/cm in lengthwise and 2
- 20 strands/cm in crosswise direction, which means 1 warp strand/cm and 2 weft strands/cm.
- an asymmetrical structure, for example, would be 2x2 ER (edge reinforcement), i.e. 2 strands/cm in both lengthwise and crosswise direction, whereby the edge area of the mesh in the crosswise direction has 4 instead of 2 strands/cm, which means 2 warp strands/cm and 2 weft strands/cm although in the edge area there would be 4 warp strands instead of 2 warp strands/cm.

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In addition, warp strands may be arranged double or in multiples, although the weft strands do not need to reflect the same amount.

Furthermore, different strand sizes can be used between the weft and warp strands, this

30 includes using different diameters or different substance groups e.g. polyester and glass, however a least one of the two strands should be based on glass.

In yet another version, the glass nonwoven mat is placed in edge/margin areas or middle areas of the glass nonwoven width with reinforcing strands – which are also based on glass strands or PES (polyester)

strands i.e. mainly arranged in lengthwise direction of the sealing web. This type of design is preferable in areas of high wind, i.e. particularly in coastal areas where there is greater wind force or force transmission points entering into the sealing web.

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The edge/margin area is fixed at 1 to 20 cm from the outer edge of the lengthwise direction of the membrane, whereby the preferred width is no more than approximately 6 cm. In addition, between 4 and 20, preferably between 4 and 10 reinforcing fibres can be arranged with a maximum spacing of 50 mm, however

10 preferably between 5 to 10 mm apart. The spacing is chosen so that the fastening plates, which are interspersed with screws or nails allow the membrane to be attached to the substrate or base. At least 3 reinforcement fibres run along the substrate or base to ensure mechanical reinforcement.

15 Furthermore, it is intended that the fibre weight of the glass cloth or glass mesh is 30 tex to 80 tex, however, 50 to 80 tex is preferred.

The total weight per unit area of the combination carrier insert should be between 80 g/m² and 200 g/m², however, a weight of between 100 g/m² and 120 g/m² is preferred.

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The sealing web itself should have a basis weight of between 1.4 kg/m² and 2.6 kg/m², however, the preferred weight is between 1.5 kg/m² and 1.9 kg/m².

The preferred thickness of the sealing web is between 1.0 mm and 2.5 mm, however of particular
25 preference would be between 1.2 mm and 2.0 mm.

The sealing web invention is characterised among other things, however in particular by its tensile strength [N/50 mm] in lengthwise direction where it measures at least 1250, preferably at least 1000, but of particular preference would be 1150 to 1180 and/or in the crosswise
30 direction at least 800, preferably a minimum of 1000, but of particular preference would be 1080 to 1110, according to EN 12311-2.

In addition, the tear propagation strength [N] in the lengthwise direction shall be measured between 180 and 250 and in the crosswise direction between 210 and 300, according to EN 12310-2.

During manufacture, the sealing web is transported in lengthwise direction. Crosswise is the direction perpendicular to this.

To prevent the connecting points of the glass cloth, glass scrim or glass mesh from forming
5 elevations on the edges of the sealing web, the invention stipulates that the glass nonwoven mat must run along the outside of the glass cloth, glass scrim or glass mesh which is not the attachment side of the construction area.

In the case of alternative roofing membrane products known to those in the industry containing
10 mesh reinforcements or inserts, the connecting points can come to the surface of the roofing membrane causing a structural change. This is not the case with this invention as it contains a combination carrier insert consisting of glass fibres in the form of an unwoven mat as well as a glass mesh, or glass reinforcement made of cloth, scrim or a combination thereof or the glass unwoven mat of the combination carrier insert. However, the structural change in alternative
15 roofing membranes can cause channels, sinkholes, or puddles allowing dirt, water, algae, insects, etc to accumulate. When these substances or organisms which have collected interact with the roofing membrane, or the components contained in the roofing membrane, e.g. the plasticiser, this can lead to accelerated ageing, especially around the areas where these reservoirs or channels
20 have formed, which in turn results in a shorter lifespan of the roofing membrane.

This effect is avoided by the invention's use of the combination carrier insert made of glass fibres in the form of a nonwoven mat as well as a glass mesh or a glass reinforcement consisting of a
25 cloth, scrim or combinations thereof, as this structural change in the surface can no longer occur.

By using a combination carrier insert consisting of glass mesh or a glass reinforcement consisting of cloth, scrim or combinations thereof with a glass nonwoven mat, this results in improved fire resistance of the reinforcement or insert or the roof membrane or the complete roof
30 structure, which can be demonstrated in accordance with CEN/TS 1187:2012 "External fire exposure to roofing materials".

Another positive aspect is the improved sealing properties of the roofing membrane. This is due, in particular, to the smooth and wave-free nature of the roofing membrane. When welding with automatic welding machines, this results in fewer imperfections, i.e. imperfections which have to
5 be subsequently sealed by hand using hot air hand tools and the same materials as an additional workload. This enables better handling and faster laying time of the roofing membrane.

Furthermore, it is intended that the sealing web will contain one or more additives or
10 additives from the group of fillers, pigments, colour additives, UV stabilisers, thermo-stabilisers, biocides, flame retardants.

Additives in the layers should differ in their proportions according to the desired effect. For example, in the outer layer or outer layers that run above the combination carrier insert when the
15 roofing membrane is laid, the proportion of UV stabilisers and/or thermo-stabilisers and/or fungicides should be greater than in the layer or layers running underneath the combination carrier insert.

Preferably the intention is that one or two layers containing the base polymer and the monomer
20 plasticiser run above the combination carrier insert and one layer below the combination carrier insert, i.e. on the building side, whereby the proportion of additives in the individual layers can vary as mentioned above.

25 In terms of processing, the innovative roofing membrane can be produced by (co-)extrusion using one or more stacks of calenders, the calendering process, or by brushing with plastisol. The combination carrier insert can be produced in a preceding step or can be added to the process as a separate glass nonwoven mat and glass mesh insert.

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Further details, advantages and characteristics of the invention result not only from the requirements, the characteristics to be inferred from them, for themselves and/or in combination but also from the following description of preferred examples of use.

It shows:

- Fig. 1 A section of the sealing web
- 5 Fig. 2 A stack of calenders – also known as a Calender, calender unit or roll calender machine
for manufacturing the sealing web as per Fig. 1
- Fig. 3 A section of cloth based on a single warp
- 10 Fig. 4 A section of cloth based on a double warp
- Fig. 5 A section of a cloth-unwoven mat-composite
- 15 Fig. 6 A section of cloth with a strand spacing or mesh width of 2x2

Fig. 1 shows a section of the innovative sealing web 10, which is used in the construction sector,
20 e.g. for sealing roofs, cladding facades, lining tanks or lining cellars.

In the example, the sealing web 10 runs along a roof 12 and consists of a lower layer 14, which
runs along the roof side i.e. on the construction area side. On the lower layer 14, there is a
combination carrier insert 16 which in turn is made of a glass reinforcement 18 and runs along
25 the roof side, having strands such as glass cloth, glass scrim or glass mesh or combinations thereof
and consisting of a glass nonwoven mat 20.

In the following, the terms glass reinforcement, glass cloth, glass scrim, glass mesh are used, alone
30 or in combination, but are intended to include any design.

Two layers 22, 24 are then arranged on the combination carrier insert 16, which, like the lower
layer 14, contain or consist of soft PVC (polyvinyl chloride) and a

monomer plasticiser as well as one or more additives such as filling agents, pigments, UV stabilisers, thermo-stabilisers and biocides. The proportion by weight of the monomer softener in the respective layers 14, 22, 24 is between 25 wt.% and 40 wt.%, preferably between 25 wt.% and 37 wt.%, however in particular between 27 wt.% and 35 wt.%.

The use of a monomer plasticiser based on phthalate-based is preferred, in particular, a plasticiser from the DPHP group (Dipropyl heptyl phthalate), DINP (diisononyl phthalate), DIDP (diisodecyl phthalate). The plasticiser can also be a phthalate-free plasticiser, a biobased plasticiser or a partially bio-based plasticiser.

A special characteristic of the invention is that each layer 14, 22, 24 contains wt. %:

low-molecular-weight plasticiser	25 - 45, in particular, 27 - 37
Processing additives	0 – 1.9, in particular, 0.1 – 1.50
Filling agents	0 - 20, in particular, 0 - 15
PVC	45 – 57, in particular, 46 - 56
Antioxidants	0 – 0.2, in particular, 0.1 – 0.2
UV stabiliser	0 – 0.23, in particular, 0.1 – 0.23
other stabilisers	1.5 – 1.8
Colour pigments except TiO ₂	0 – 0.14, in particular, 0.005 – 0.10
Titanium dioxide	1.0 – 12, in particular, 1 – 8
Flame retardant additives	0 – 20, in particular, 0 – 12

In particular, it is intended that the proportion of titanium dioxide in the upper layer 24 is greater than that in the middle layer 22. The titanium dioxide content of the lower layer 12 is in turn, less than that of the middle layer 22.

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In addition, both the middle layer 22 and the lower layer 12, do not need to contain antioxidants and stabilisers this includes UV stabilisers.

The proportion of calcium carbonate in the lower layer 14 can be greater than in the middle layer 22, and the latter in turn can be greater in the upper layer 24.

The glass nonwoven mat 20 of the combination carrier insert 16 has a basis weight of between 30 g/m² and 90 g/m².

The glass fibres of the glass nonwoven mat or glass mesh or glass cloth, i.e. the glass reinforcement
5 18, should have a thickness of between 13 µm and 18 µm. The glass fibres of the glass cloth, glass scrim or glass mesh are characterised by a weight of 60 tex to 80 tex.

In addition, the strand spacing or mesh width or fibre construction of the glass cloth, glass scrim
10 or glass mesh should be 3x3 to 4x4.

The surface weight of the sealing web 10 should be between 1.4 kg/m² and 2.6 kg/m², with a preferred thickness of 1.2 mm to 2.0 mm.

15 The layers 14, on the one hand, and 22, 24 on the other hand, will be attached to the combination carrier insert 16, in particular, by calendering, brushing or by extrusion.

In particular, it is intended that the layers 22, 24 will be coextruded and the layer
20 14 can be produced by extrusion with a single-channel nozzle.

The coextruded layers 22, 24 and the layer 14 are then attached to the combination carrier insert 16 which runs between them, using a single stack of calenders – also known as a calender unit or roll calender machine. The various steps in this process are pictured with single stack of
25 calenders.

The glass nonwoven mat 20 and the glass cloth, glass scrim or glass mesh 18 are impregnated with a binding agent, which consists of or contains at least one substance from the group styrene-butadiene, acrylate, PVC, EVA. This binding agent is then used to attach the combination carrier insert to the
30 adjacent layers 14, 22.

Sealing webs produced in this manner, have a tensile strength in N/50 mm of the lengthwise direction of at least 800, preferably of approximately 1150 to 1250 and in the crosswise

direction of at least 800, but preferably approximately 1080 to 1100, with the measurement being in accordance with EN 12311-2.

The maximum tensile elongation in the lengthwise and crosswise direction is approximately 2 -
5 5% also measured in accordance with EN 12311-2.

The tear resistance according to EN 12310-2 is approx. 220 N in the lengthwise direction and approx. 270 N in the crosswise direction.

10 The nail tear resistance according to EN 12310-1 is approx. 320 N in the lengthwise direction and approx. 375 N in the crosswise direction.

With regard to dimensional stability, according to EN 1107-2 the values were given in lengthwise direction -0.07% and crosswise direction -0.07%.

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Fig. 2 shows a calender 100 although purely the principle behind it, with which the innovative sealing web can be produced using the extrusion or calendering process.

20 The calender is made up of a lower roller or drum 102, a middle roller or drum 104, and an upper roller or drum 106. In addition, two cooling rollers 108, 110 are shown in the example.

Furthermore, the calender 100 has a co-extrusion nozzle 112 and a single channel nozzle

25 114 which are each connected to a corresponding extruder.

To produce the roofing membrane 10, the combination carrier insert 16 is removed off a winder and guided through the rollers or drums 102, 104, 106. Following on from the lower and middle
30 roller 102, 104 and prior to the combination carrier insert 16 being passed between the rollers 104 and 106, the middle layer 22 and outer layer 24 are applied via the extrusion nozzle. After passing between the lower and middle rollers 102, 104 heat is applied with an IR radiant heater 105. Then, on the opposite side of the combination carrier insert 16,

the lower layer 14 is applied using an extrusion nozzle 114. The roofing membrane 10 is then passed between the middle roller 104 and the upper roller 106 before finally passing around the cooling rollers 108 and 110.

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By using the combination carrier insert 16, the two other already extruded layers - middle layer 22 and the outer layer 24 - are protected from very high heat input during the extrusion of the lower layer 114. This has a positive effect on the ageing of the middle layer 22 and the upper

10 layer 24. This can be proven by the Yellowness Index.

Various alternatives for glass fibre orientation in the laying structure of the glass reinforcement are shown in Fig. 3 to 6.

15 Fig. 3 shows scrim with a single warp. The warp strands run above and below the weft strands, however, the upper and lower warp strands are offset from each other at a specified distance. At regular intervals, a warp strand below a weft/fill strand is followed by a warp strand above a weft strand. Two strands meet at the cross point.

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Fig.4 shows a double warp in which the warp strands lie on top of each other, i.e. the upper and lower warp strands always lie on top of each other so that the weft strands run between the strands of the upper and lower warps. Thus, the three strands meet at the cross point.

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Fig. 5 shows a section of the glass reinforcement in the form of scrim with a nonwoven mat. The scrim can, for example, have a single or double warp – however, in this example it is a single warp. The scrim is then bonded to the glass nonwoven mat.

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Fig. 6 shows single warp again like in Fig. 3. As in all the drawings, the warp strands are marked with a K and the weft strands are marked with an S. The length specification also indicates the strand spacing or mesh width.

The mesh width or strand spacing in the example in fig. 6 is 2x2, which means that 2 warp strands are used.

In particular, it is intended that the warp strands K run in the lengthwise direction of the roofing
5 membrane and the weft/fill strands K run perpendicular to the warp strands K. This results in the following advantages.

If, for example, on a building site off-cuts of the roofing membrane are required, which means pieces of membrane that do not correspond to the width produced, i.e. they need to be
10 narrower, then the roofer needs to cut the membrane to the required size. Usually at least two points are attached to the membrane in order to ensure a straight edge.

Due to the innovative design of the warp strands, this task is simplified. Only a small cut at the cross margin corresponding to whichever width is required is necessary. Following this, the
15 membrane can be torn to any desired length. Alternatively, a strip can be torn out of the middle section, in which case two cuts would have to be made.

“Tearing” is possible thanks to the warp strands running in the lengthwise direction of the roofing membrane. A straight edge is created which although frayed, does not pose any
20 problems for the roofer as this is used as the lower seam when welding the joint. In other words, an original membrane sheet with a clean-cut edge covers the membrane sheet, which was manually torn to size on-site, thus the appearance is not negatively affected in any way. Also, this prevents a possible capillarity of the reinforcement occurring as there are no exposed strands on
25 the upper side of the roof. Therefore, the invention makes the roofer’s job easier.

5 Patent claim

Sealing Web

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1. A multi-layer sealing web (10) for a region of a structure, such as a roof, cladding, cellar or tank, the sealing web features outer layers (14, 22, 24) which contain a base polymer such as polyvinyl chloride or a polyvinyl chloride copolymer, and a plasticiser, as well as a glass nonwoven mat (20) and a combination carrier insert (16) containing a glass reinforcement
15 (18), the plasticiser is a low-molecular-weight plasticiser of which the proportion in the outer layers (14, 22, 24) containing the base polymer is between 25 wt.% and 40 wt.%, and in particular, the combination carrier insert (16) has a binding agent based on at least one substance from the group styrene-butadiene, acrylate, PVC, EVA or a preferred combination
20 thereof.
2. The sealing web according to Claim 1, characterised in that,
25 the combination carrier insert (16) contains at least one glass reinforcement (18) from the group: glass woven cloth, glass scrim, glass mesh or any combination of these.
3. The sealing web according to Claim 1 or 2, characterised in that,
30 the glass reinforcement (18) is a flat structure with strands running lengthwise and crosswise in either one or more layers of parallel strands in particular stretched strands with the cross points of the lengthwise and crosswise strands preferably being fixed, the securing takes place in particular either by material closure or mechanically by frictional connection and/or form closure (positive locking).

4. The sealing web according to at least one of the preceding claims,
characterised in that,
the proportion of low-molecular-weight plasticiser is between 25wt. % and 37 wt.%, in
particular, between 27wt. % and 35 wt.%.
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5. The sealing web according to at least one of the preceding claims,
characterised in that,
the glass nonwoven mat (20) has a basis weight between 30 g/m² and 90 g/m² and/or the glass
fibres of the glass nonwoven mat (20) have a thickness of between 13 µm and
18 µm.
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6. The sealing web according to at least one of the preceding claims,
characterised in that,
the glass fibres of the fibreglass cloth, fibreglass scrim or fibreglass mesh (18) have a strand
15 spacing or mesh width of 2x2 to 6x6, preferably, 3x3 to 4x4.
7. The sealing web according to at least one of the preceding claims,
characterised in that,
20 the low-molecular-weight plasticiser is a phthalate-based plasticiser, in particular, a plasticiser
from the group DPHP (dipropyl heptyl phthalate) DINP (diisononyl phthalate), DIDP (diisodecyl
phthalate) or a plasticiser which is phthalate-free, or at least partially bio-based.
- 25 8. The sealing web according to at least one of the preceding claims,
characterised in that,
the weight of the fibres of the glass cloth, glass scrim or glass mesh (18) are 30 tex to 80 tex.
- 30 9. The sealing web according to at least one of the preceding claims,
characterised in that,
the sealing web (10) has a basis weight of 1.4 kg/m² and 2.6 kg/m², in particular, between 1.5
kg/m² and 1.9 kg/m².

10. The sealing web according to at least one of the preceding claims,
characterised in that,
the thickness of the sealing web (10) measures between 1.0 mm and 2.5 mm, in particular,
between 1.2 mm and 2.0 mm.
- 5
11. The sealing web according to at least one of the preceding claims,
characterised in that,
the tensile strength in N/50 mm in the lengthwise direction measures at least 800, preferably
at least 1000, in particular 1150 to 1250, and/or in the crosswise direction at least 800,
10 preferably 1080 to 1110.
12. The sealing web according to at least one of the preceding claims,
characterised in that,
the sealing web (10) has a tear resistance in N in its lengthwise direction of between 180
15 and 250 and/or in the crosswise direction of between 210 and 300.
13. The sealing web according to at least one of the preceding claims,
characterised in that,
20 the glass nonwoven mat (20) runs along the outer side of the glass cloth, glass scrim or glass
mesh (18) which is not the side being attached to the construction area.
14. The sealing web according to at least one of the preceding claims,
characterised in that,
25 the sealing web (10) contains one or more of the additives from the group: filling agents,
pigments, colour additives, UV stabilisers, thermo-stabilisers, biocide.
15. The sealing web according to at least one of the preceding claims,
characterised in that,
30 the sealing web (10) consists of a first outer layer (14) which runs along the side to be attached
to the construction area, a combination carrier insert (16), as well as at least one outer layer
(22, 24) which runs along the side of the combination carrier insert (16) which is not being
attached to the construction area.

16. The sealing web according to at least one of the preceding claims,
characterised in that,
the side of the combination carrier insert (16) which is not being attached to the construction
5 area has two layers, one middle layer (22) and an outer layer (24).

17. The sealing web according to at least one of the preceding claims,
characterised in that,
in particular, each layer (14, 22, 24) contains or consists of wt.%:

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low-molecular-weight plasticiser	25 - 45, in particular, 27 - 37
Processing additives like lubricants	0 – 1.9, in particular, 0.1 – 1.50
Filling agents like calcium carbonate	0 -20, in particular, 0 - 15
PVC	45 – 57, in particular, 46 - 56
Antioxidant	0 – 0.2, in particular, 0.1 – 0.2
UV stabiliser	0 – 0.23, in particular, 0.1 – 0.23
other stabilisers	1.5 – 1.8
Colour pigments except TiO ₂	0 – 0.14, in particular, 0.005 – 0.10
Titanium dioxide	1.0 – 12, in particular, 1 – 8
Flame retardant additives	0 – 20, in particular, 0 – 12

18. The sealing web according to at least one of the preceding claims,
characterised in that,
15 the glass reinforcement (18) has intersecting warp and weft strands (K, S).

19. The sealing web according to at least one of the preceding claims,
characterised in that,
the glass reinforcement (18) has a single or double warp structure.

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20. The manufacturing process of the sealing web (10) according to at least one of the preceding claims,
characterised in that,
5 the outer layers (14, 24) are produced by extrusion, calendaring, or by brushing, and then joined to the combination carrier insert (16).
21. The manufacturing process of the sealing web (10) according to at least one of the Claims 1 to 19,
characterised in that,
the layers (22, 24) which run along the side of the combination carrier insert facing away from the construction area, are produced by coextrusion or the calendaring or brushing process. Also, that the coextruded layers (22, 24), the combination carrier insert (16) and the layer (14) which was produced by extrusion and runs along the side being attached to the construction area, are all joined to together by a single stack of calenders.