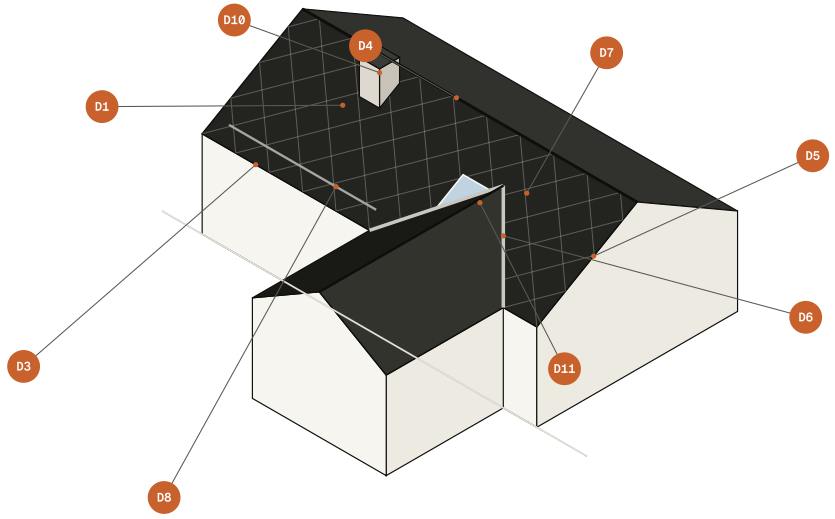
Installing *Solskifer*

How to install solar roof tiles in laminated toughened glass — with detail drawings drawn after the Byggforskserien design sheets (525.101, 525.106, 525.777 and 525.779) with Solskifer as the roof covering: every critical junction as its own section drawing with full layer build-up, air paths, material coding and dimensions. Each figure states which sheet and figure it is based on.

CONTENTS

D0 The details on the roof — overview

Each marker is a detail drawn at a larger scale further down. Click to jump to it.



D1 Roof build-up · D3 Eaves · D4 Ridge · D5 Gable and verge · D6 Valley (D6b section) · D7 Bracket and fixing · D8 Snow guard · D10 Penetration · D11 Roof window. The batten spacing (D2) applies to the whole roof surface. D9 (roof against a higher wall) is a situation this house does not have — see the detail further down.

00 Safety first

Solskifer is an electrical installation on the roof. Read this before work starts.

LIVE IN DAYLIGHT

All wiring is live as long as light reaches the panel. Always treat cables and connectors as energised.

TERMINATE EVERY STRING

At the end of the working day, in rain or at any interruption: use rubber end plugs when terminating a string, or ready-made loops. This keeps moisture out of the MC4 connectors and protects people and animals from the voltage present in the plugs.

- All electrical connections, wiring runs and the inverter are connected by a certified / registered electrician.
- Carry out the short-circuit test and all other required tests in accordance with NEK 400.
- An installation can carry several kW of power and several hundred volts DC — use only equipment approved for this.
- Glass is strong, but handle it with care. Avoid impacts on edges and corners.

Under Forskrift om elektrisk utstyr § 21 (the Norwegian regulation on electrical equipment), we are obliged to inform you that installation equipment intended to form part of a fixed electrical installation must be installed by a registered installation business.

01 Preparation and prerequisites

Solskifer is laid like roof tiles: on tile battens over counter battens, outside a watertight underlay. The roof structure beneath the underlay is designed separately.

Roof coverings vary in how well they seal against snow and driving rain, and the Solskifer design provides a good seal. Beneath the Solskifer there must always be a watertight underlay (roof boarding with an underlay membrane, or another underlay as designed), and the Solskifer is laid on tile battens over counter battens — the counter battens form a ventilation gap from eaves to ridge (D1). How the roof is built up beneath the underlay — insulated roof surface or cold attic, ventilation, vapour barrier — is outside this guide and is designed to Byggforsk 525.101 / 525.106. Note that 525.101 cl. 222 sets its own requirements for the underlay and ventilation beneath coverings without condensation-buffering capacity, such as solar panels.

- The recommended minimum roof pitch is 15° (Byggforsk table 24: roof tiles 15°). Solskifer should not be laid below 15°.
- An eaves overhang of at least 400 mm protects the walls well (525.101 cl. 72). Large overhangs must be designed for snow and wind loads.
- Local conditions (525.101 table 26 a): wind-exposed → smaller gap openings at the eaves and a good settling chamber; snowy and wind-exposed → mesh against drifting snow; mild and humid → treated battens and counter battens; composite roofs with valleys, dormers or roof windows → cross ventilation.
- For design: Byggforsk 525.101 (ventilated timber roofs), 525.106 (cold attics) and 525.866 (underlays). The closest covering sheet is 544.101 on roof tiles — Solskifer is laid like roof tiles on battens; 544.102 «Tekking med skifer» (slate roofing) was the reference in v6.2.
- Check every roof surface before battening — is the roof side square? Measure the diagonals and the width at the top and bottom, especially on refurbishment.

> CHANGES FROM V6.2
>
> Three points depart from v6.2: (1) v6.2 says Solskifer “can be installed on a simplified underlay” — this edition takes no position on the type of underlay (it is designed separately), so the sentence has not been carried over. (2) The eaves flashing is drawn *on the underlay* with the counter batten above it, so the air intake to the counter-batten gap stays open (D3) — v6.2 draws it on top of the counter battens. (3) Counter battens must be at least 36 mm, and higher on long roof surfaces (Byggforsk 525.101 table 33 a) — v6.2 allowed down to 23 × 36 mm.

> RESPONSIBILITY
>
> This guide covers the installation of our Solskifer panels. The installer is responsible for ensuring that the installation and the underlying structure comply with current regulations and standards.

02 Roof build-up

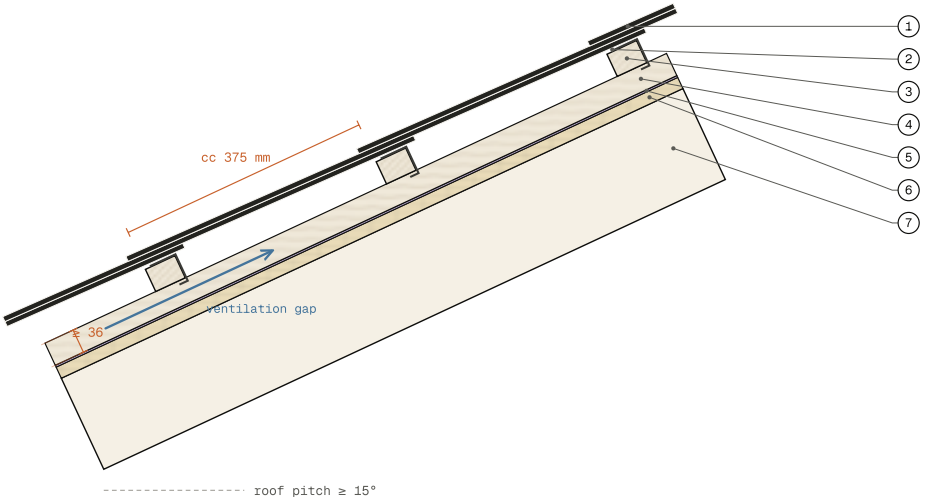
Solskifer is laid on tile battens over counter battens, outside the underlay — the counter battens form the ventilation gap beneath the panels.

D1

Roof build-up — section along the roof slope

Counter battens and battens outside the underlay form the ventilation gap beneath the Solskifer. Drawn at 25°; the section lies between two rafters.

Basis: Byggforsk 525.101 fig. 711 and cl. 33 (counter-battened coverings) – Solskifer's own drawing



1. Solskifer panel — 2 × 4 mm laminated toughened glass (8 mm), 834 mm tall on cc 375 mm: hangs by its middle on the batten, upper half beneath the row above
2. Bracket on rail — hooked over the batten from the ridge side, screwed into the batten's ridge-side face (D7)
3. Tile batten 36 × 48 mm, cc 375 mm (36 × 73 in severe-weather areas)
4. Counter batten ≥ 36 mm, cc 600 mm — the ventilation gap beneath the Solskifer, open from eaves to ridge
5. Underlay membrane — sealed at joints and penetrations
6. Roof boarding (boards or panels) — or another underlay as designed
7. Rafter / roof structure — insulation, vapour barrier and ventilation beneath the underlay are designed to Byggforsk 525.101 / 525.106

The counter-batten height is chosen from the length of the ventilation gap (Byggforsk 525.101 table 33 a) — never below 36 mm. The panel is 834,4 mm tall on cc 375 mm and hangs by the rail at mid-height — the roof is always covered in two layers, three at the shoulders.

The ventilation gap beneath the Solskifer must carry away moisture and keep the covering cold when there is snow on the roof — so the snow does not melt and freeze into ice at the eaves. The gap also drains any precipitation that gets in beneath the panels. Intake and outlet at the eaves, ridge and gable must match the counter-batten height.

Underlay

Roof boarding (boards or panels) with an underlay membrane, or another underlay as designed. The underlay must be rain-tight, including joints and around penetrations (Byggforsk 525.866), and is carried out over the eaves and into valleys.

Roof function

Keep the roof surface as cold as possible, so that snow does not melt from heat escaping from inside — that is decided by the structure beneath the underlay (insulation, vapour barrier and ventilation to Byggforsk 525.101 / 525.106). A cold Solskifer roof also benefits energy production.

Counter battens and battens

Counter battens never below 36 mm, cc 600 mm. The height is chosen from the length of the ventilation gap (525.101 table 33 a): on long roof surfaces, with a closed ridge or thick insulation the counter battens must be higher than 36 mm. Batten 36 × 48 mm; 36 × 73 mm where the counter-batten spacing exceeds 600 mm, or in severe-weather areas.

Gap openings

The openings for air intake and outlet at the eaves, gable and, where used, the ridge must be approximately as large as the counter-batten height, covered with mesh (60 % open area) and have a settling chamber against drifting snow — the eaves overhang does that job (D3). If in doubt whether the site has wind, the ridge should be ventilated so thermal buoyancy helps (D4).

Cross ventilation

Roofs with valleys, dormers, raised sections, roof windows or chimneys must be cross-ventilated: the battens across the counter battens provide it in the counter-batten gap, provided there are gap openings along the gables too (D5). The counter battens are cut back around penetrations so air passes around (D10, D11).

PENETRATIONS

Chimneys, roof windows, ventilation ducts and soil pipes are critical points for watertightness — and they block the ventilation gap. A collar in the underlay membrane, counter battens cut back so air passes around, and adaptation plates in aluminium composite (ACP) complete the covering in towards the flashing (D10, D11).

03 Batten spacing

The batten spacing is cc 375 mm. It can be adjusted — but one panel must never cover solar cells in the panel in the row below.

D2 Batten spacing — seen on the roof

cc 375 mm, with adjustment towards the ridge. One panel must never cover solar cells in the panel in the row below.

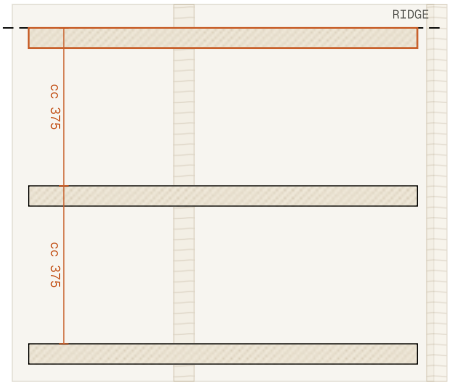


Figure 1 — start from the ridge
Battens at cc 375 mm, adjustment at the top against the flashing

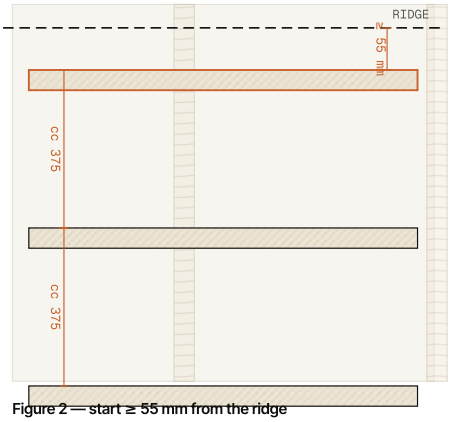


Figure 2 — start ≥ 55 mm from the ridge
Then cc 375 mm downwards, adjustment at the bottom

Figure 1: battens at cc 375 mm from the ridge, adjustment at the top against the flashing. Figure 2: start a minimum of 55 mm from the ridge, then cc 375 mm downwards with adjustment at the bottom. The outer edge of the bottom batten equals the position you want for the eaves flashing.

How it is built up

1. Build up the first batten (36 × 48) with a 5 mm thick piece of counter batten. Do not use a thicker batten — the bracket will not fit (only 40 mm internally).
2. The outer edge of the bottom batten equals the position you want for the eaves flashing.
3. Continue battening at cc 375 mm, with adjustment at the top (figure 1).
4. Alternatively, start the battening a minimum of 55 mm from the ridge, then cc 375 mm downwards with adjustment at the bottom (figure 2).

> PACKER — DO NOT INCREASE THE BATTEN THICKNESS
>
> Use a 5 mm packer to raise the first battens. Do not increase the general batten thickness, since the bracket is only 40 mm internally.

04 Details and junctions

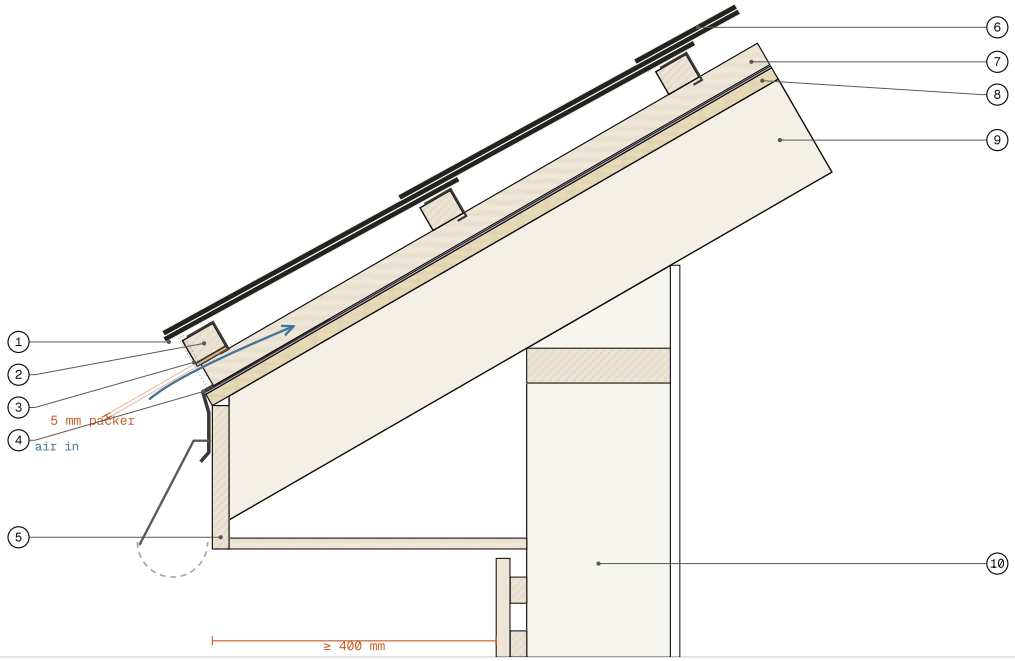
Eaves, ridge, gable, valley, higher wall, penetration, roof window and snow guard — drawn after the Byggforsk sheets, with Solskifer as the covering. The points where precision decides the result.

D3

Eaves — section

The rafter runs out to the fascia board, the underlay over the edge and the eaves flashing on the underlay. Air into the counter-batten gap over the flashing, under the foot panel. Drawn at 30° roof pitch, overhang ≥ 400 mm.

Basis: Byggforsk 525.101 fig. 72 a/72 c, cl. 34 and 72 — Solskifer's own drawing



1. Solskifer foot panel (half panel with straight bottom edge) — hangs by its rail on the bottom batten, bottom edge 45 mm below the rail at the eaves; the row above covers it
2. Bottom batten 36 × 48 mm on a 5 mm packer — the batten's outer edge = top edge of the eaves flashing; further battens cc 375
3. Air intake to the counter-batten gap: opening ≈ counter-batten height (≥ 36 mm) between flashing and foot panel, with bird comb/mesh
4. Eaves flashing on the underlay, counter batten above — can be split into a standard flashing plus an adjustment flashing
5. Fascia board with gutter bracket and gutter — outside the Solskifer supply (sheet-metal work)
6. Solskifer panels — 834 mm tall on cc 375: each row hangs by its middle on its batten, upper half beneath the row above, lower end resting on the row below (D1)
7. Counter batten ≥ 36 mm — the ventilation gap beneath the Solskifer, open from the eaves upwards
8. Roof boarding with underlay membrane — carried out over the fascia board, membrane over the edge
9. Rafter — continuous out to the fascia board; an overhang ≥ 400 mm protects the wall
10. External wall — structure, insulation and sealing are designed separately

⚠ To be confirmed: v6.2 draws the eaves flashing on top of the counter battens; here it lies on the underlay so the intake to the counter-batten gap stays open (Byggforsk fig. 72 a). Preferably raise the solar field as close to the ridge as possible — a clean start at the bottom, and the cells are protected from ladder use at the eaves.

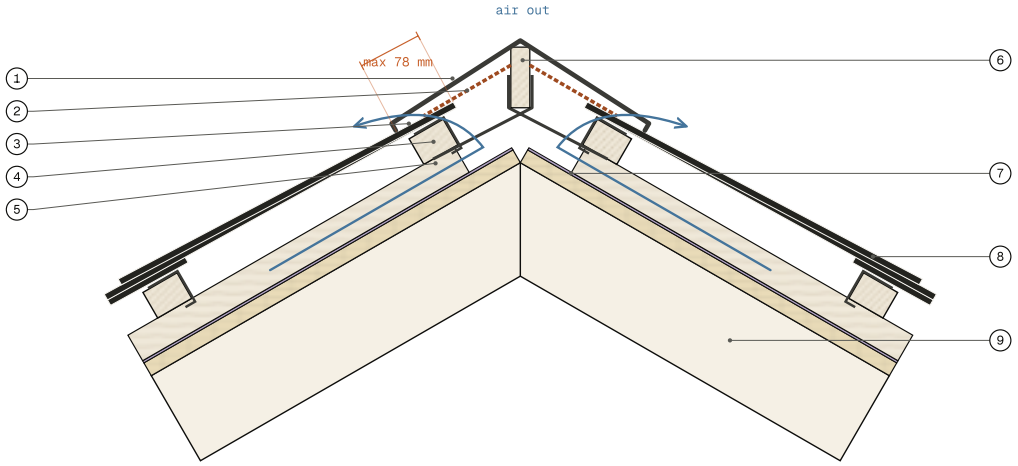
In many cases it is a good solution to raise the solar roof as close to the ridge as possible. This gives a tidy start at the bottom and a good ridge solution — and as a bonus protects the solar cells from accidental damage when a ladder is used at the eaves.

D4

Ridge — section

Ridge tiles (half panels) on both sides, ridge board on a bracket, ridge flashing above. Underlay tight at the ridge, air OUT from the counter-batten gap. Drawn at 30° roof pitch.

Basis: Byggforsk 525.101 fig. 73 d (cf. 73 b), cl. 35 and 62 — Solskifer's own drawing



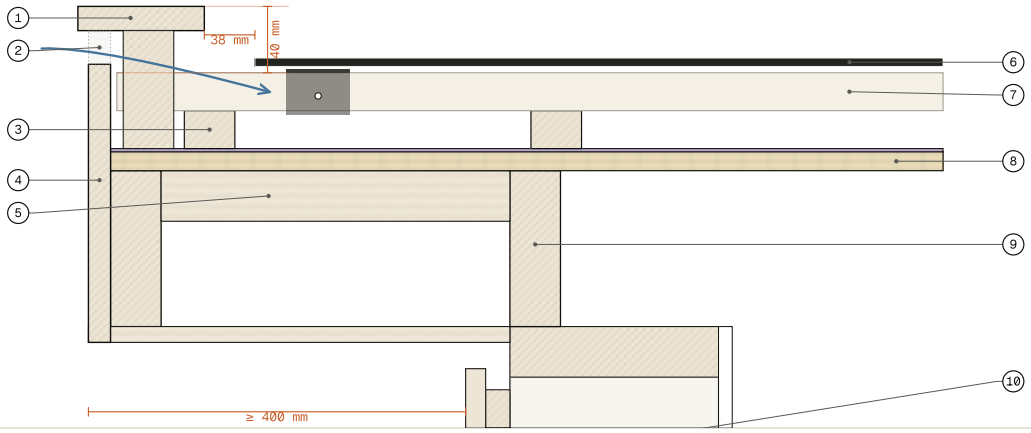
1. Ridge flashing (bent plate) — covers the panel by up to 78 mm, never over solar cells
2. Ventilated ridge roll between ridge board and ridge tile — lets air out, stops driving rain/snow (fig. 73 b)
3. Solskifer ridge tile (half panel with straight top edge) — hangs by its rail on the top batten, top edge 45 mm above the rail; the glued-on clip under the lower end is pushed between the panels in the row below
4. Top batten — ridge-side edge ≥ 55 mm from the ridge (D2, figure 2), then cc 375 downwards
5. The counter batten stops short of the ridge — air OUT at the ridge (opening ≈ counter-batten height)
6. Ridge board on a ridge bracket fixed to the counter battens (Byggforsk fig. 73 d)
7. Roof boarding with underlay membrane — the membrane TIGHT over the ridge
8. Solskifer panels in the row below the ridge tile — hang by their middle on their batten, the tips reach up to the ridge tile's top edge
9. Rafters — the structure beneath the underlay is designed separately

Choose a ridge solution with sufficient airflow — the opening at the ridge should equal the counter-batten height. Where the site has little wind (< 1 m/s) the ridge should be ventilated to exploit thermal buoyancy (525.101 cl. 35). The clip on the ridge tile is pushed between the panels in the row below before the bracket is screwed down.

D5 Gable and verge — section across the roof slope

Top board 40 mm above the battens, panel edge free of solar cells. A mesh-covered gap under the top board lets air in and out of the batten layer along the gable.

Basis: Byggforsk 525.101 fig. 74 b, cl. 36 and 74 – Solskifer's own drawing

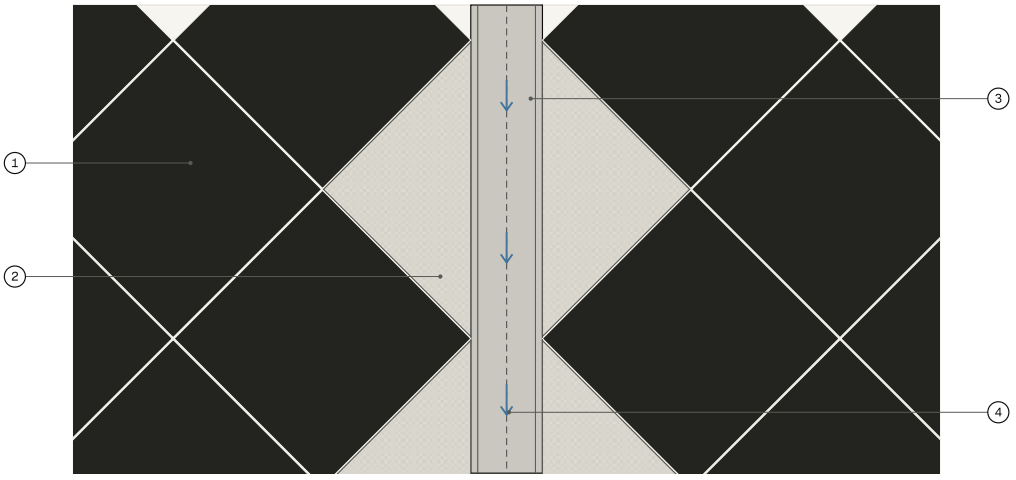


1. Top board — top edge 40 mm above the battens; choose a solution where the board does not cover the solar cells
2. Mesh-covered gap under the top board — air in/out of the batten layer along the gable (cross ventilation)
3. An extra counter batten near the edge supports the batten ends — counter batten ≥ 36 mm
4. Bargeboard on the verge rafter (gable rafter)
5. Outriggers/noggings carry the overhang — an overhang ≥ 400 mm must be designed for snow and wind loads
6. Solskifer panel — the edge towards the verge is kept free of solar cells (38 mm clearance to the top board); top corners aligned with guide clips
7. Batten 36 × 48 mm — runs tight to the verge
8. Roof boarding with underlay membrane — carried right out to the verge
9. Rafter over the gable wall
10. Gable wall — furring and cladding terminate open beneath the overhang; the structure is designed separately

Roofs with valleys, dormers, raised sections or roof windows MUST be cross-ventilated, and then the batten layer needs gap openings along the gables (525.101 cl. 36). Alternative to the top board (installer experience): a verge flashing that slides over the bargeboard — and down into the gutter where the roof meets an abutment gutter — gives good sideways ventilation and clears the glass.

D6 Valley — seen on the roof

Two roof surfaces meeting the same valley gutter. Adaptation plates in aluminium composite (ACP) are cut against the gutter.



1. Whole Solskifer panels — laid in towards the gutter
2. Adaptation plate in aluminium composite (ACP) — cut against the gutter; can be drilled and screwed with ordinary carpentry tools
3. Valley / valley-gutter flashing with upstand — sheet-metal work
4. Direction of fall — water collects in the gutter

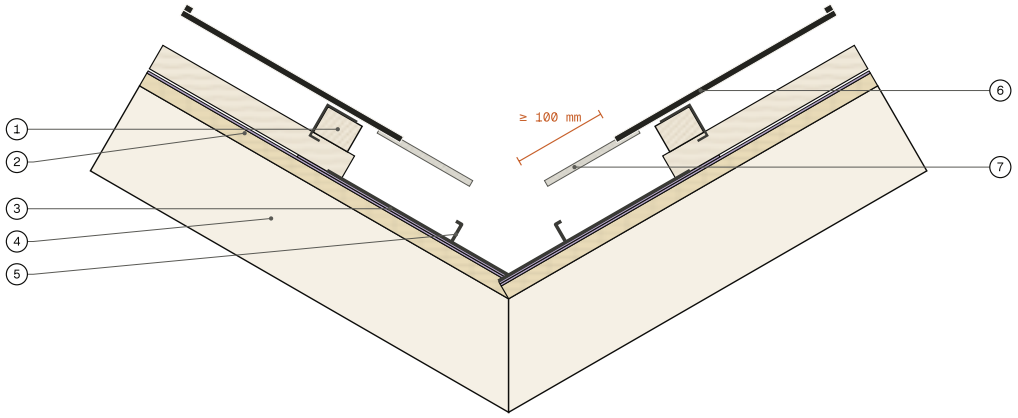
The adaptation plates are not glass and produce no power — they complete the roof covering in towards the gutter. The gutter and its flashings are designed and installed by a tinsmith (sheet-metal worker).

D6B

Valley — section across the valley gutter

Valley flashing with upstands on the underlay, adaptation plates in towards the gutter, counter battens and battens stop at the gutter. Drawn at 30° pitch on both surfaces.

Basis: Byggforsk 525.101 fig. 76 (cf. 525.779 fig. 63 a), cl. 36 and 76 — Solskifer's own drawing



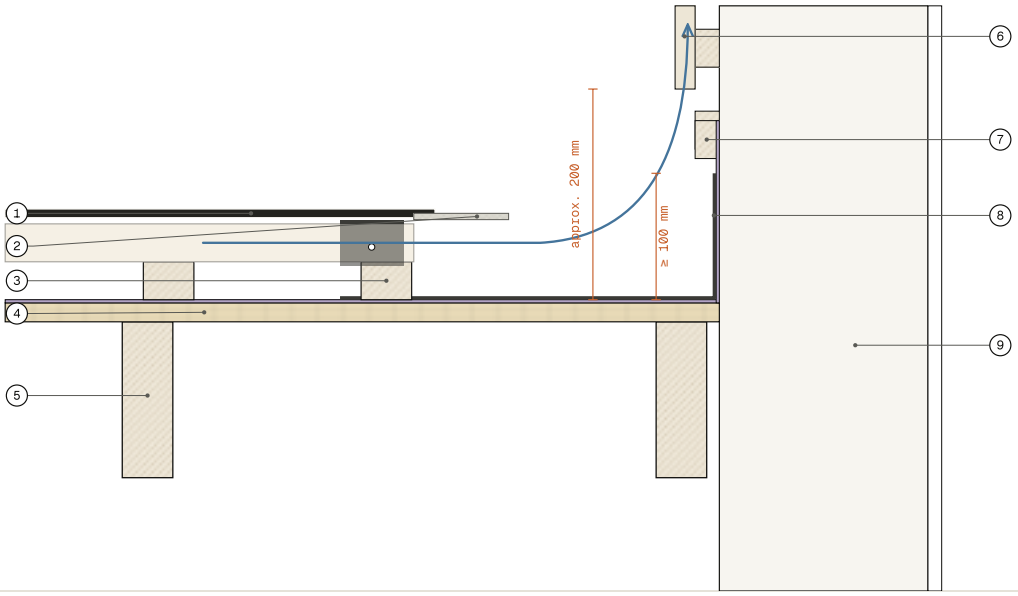
1. Batten and counter batten stop at the gutter — counter battens of at least 36 mm give better ventilation at gutters (525.779)
2. Roof boarding with underlay membrane — carried right into the gutter
3. Strip of underlay membrane along the gutter, over the boarding membrane — extra protection against ponding from icing
4. Rafters — the valley rafter lies behind the section; the structure beneath the underlay is designed separately
5. Valley flashing with upstand/welt — width according to the catchment; designed and installed by a sheet-metal worker
6. Solskifer panel — active panels kept ≥ 100 mm from the gutter (the same clearance as in the roof calculator)
7. Adaptation plate in aluminium composite (ACP) — cut against the gutter upstand, laid with overlap onto the flashing

Roof surfaces at valleys must have a continuous ventilation gap from intake to outlet and be CROSS-VENTILATED — the batten layer then needs gap openings along the gables (D5). See D6 for the laying seen from above.

D9 Roof against a higher wall — abutment gutter, section across the slope

The underlay membrane is turned up the wall and clamped. Abutment flashing with an upstand ≥ 100 mm, approx. 200 mm clear to the cladding. Air from the batten layer out behind the cladding.

Basis: Byggforsk 525.101 fig. 75 a (cf. 75 b), cl. 75 — Solskifer's own drawing



1. Solskifer panel — last row towards the wall; whole panels as far as possible
2. Adaptation plate in aluminium composite (ACP) — the "remainder" towards the gutter, laid with overlap onto the flashing
3. Batten and counter batten stop at the gutter — air from the batten layer OUT behind the cladding (cross ventilation)
4. Roof boarding with underlay membrane — the membrane is turned up the wall
5. Rafters — the structure beneath the underlay is designed separately
6. Cladding terminates approx. 200 mm above the gutter; the cavity behind the cladding stays open
7. Underlay membrane turned up the wall and clamped with a batten — sealed behind the flashing
8. Abutment gutter flashing — upstand ≥ 100 mm up the wall, gutter wide enough to be cleaned
9. Higher wall — structure and sealing are designed separately

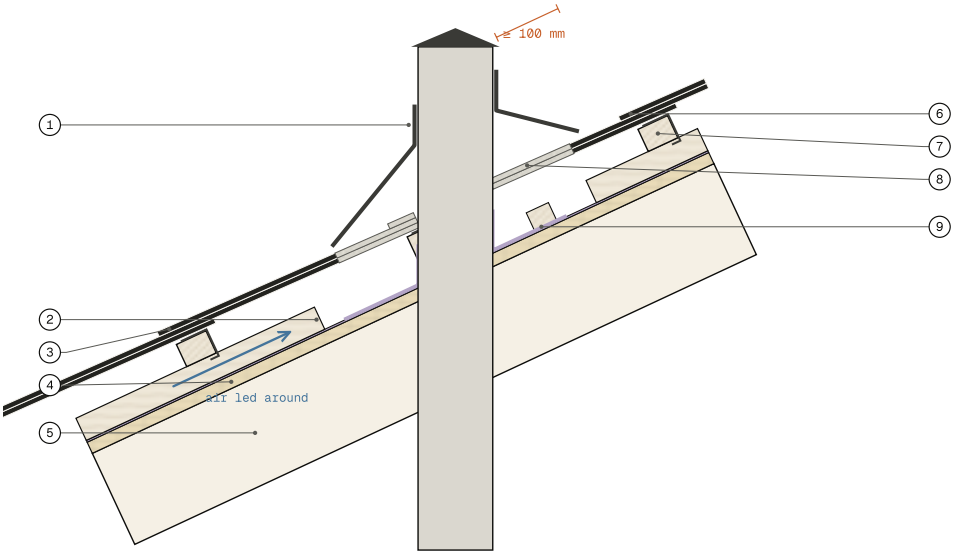
The size of the abutment gutter must suit the roof and the wall; it must be possible to clear it of leaves and snow. All flashings are designed and installed by a sheet-metal worker — outside the Solskifer supply.

D10

Penetration — vent pipe, section along the roof slope

Collar in the underlay membrane, flashing over the covering, adaptation plates around it. Counter battens are cut back on both sides so air passes around. Drawn at 25°.

Basis: Byggforsk 525.101 fig. 77 a (cf. 77 b), cl. 77 and table 26 b — Solskifer's own drawing



1. Flashing over the covering (pipe collar or chimney flashing) — sheet-metal work; overlap down onto the plates
2. Counter battens cut back on both sides so air is led around the penetration
3. Solskifer panels — active panels kept ≥ 100 mm from the penetration (the calculator's clearance rule, indicative)
4. Roof boarding with underlay membrane
5. Rafter / roof structure — sealing to wind and vapour barriers is designed separately (525.101 fig. 77)
6. Panels above the penetration — same clearance
7. Batten 36 × 48 mm on counter batten
8. Adaptation plates in aluminium composite (ACP) — cut around the pipe, laid under the flashing
9. Collar with self-adhesive flange in the underlay membrane; an angled clamping batten along the top leads water past

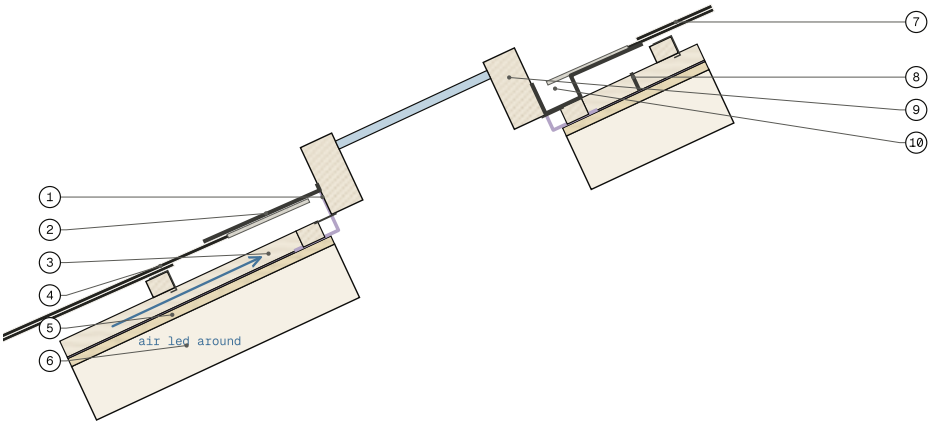
Penetrations must not impair the underlay — or the vapour and wind barriers in the structure beneath. Ventilation ducts are taken through dedicated boxes sealed all round, as for a chimney (fig. 77 b). Roof cowls must not direct warm air down onto the roof (snow melt/icing).

D11

Roof window — section along the roof slope

Frame in the roof plane on mounting battens, water deflector above, gutter flashing at the top and apron at the bottom. Air is led around the window. Drawn at 25°.

Basis: Byggforsk 525.777 fig. 61 a, cl. 53, 54, 72 and 73 – Solskifer's own drawing

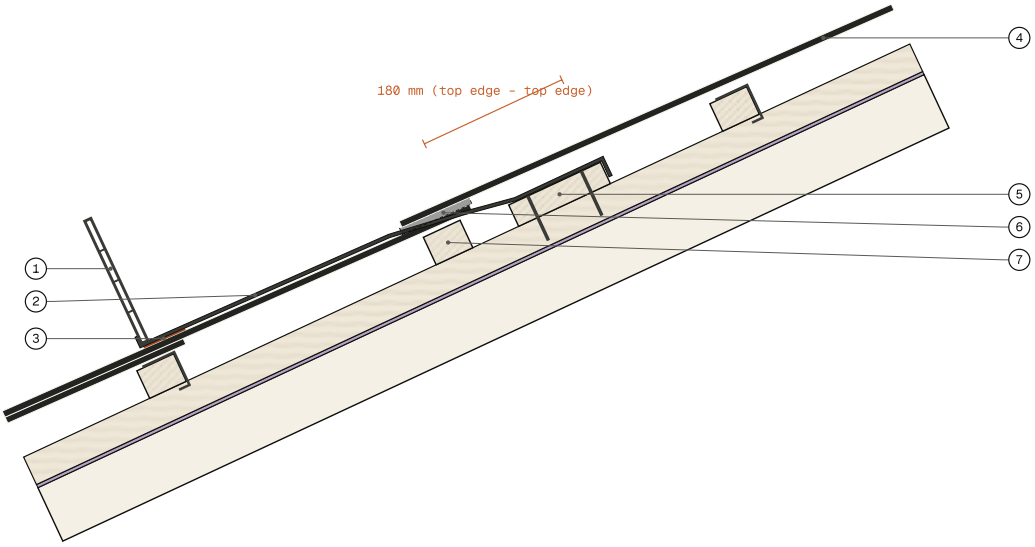


1. Adhered collar/underlay skirt — the membrane is turned up, glued and clamped to the frame; corners done carefully
2. Apron flashing at the bottom with a good lap over the Solskifer
3. Counter battens and battens terminate at the window — air is led around (cross ventilation); mounting battens along the frame
4. Solskifer below the window — active panels ≥ 100 mm from the frame; adaptation plate under the apron
5. Roof boarding with underlay membrane
6. Rafters with trimmer — structure, insulation and vapour-barrier collar are designed separately (525.777)
7. Solskifer above the window — active panels ≥ 100 mm from the frame; adaptation plate under the gutter flashing
8. Water deflector on the underlay directly above the window — water on the underlay is led past
9. Roof window in the roof plane — frame fixed to mounting battens in the same plane as the battens (mounting brackets)
10. Top flashing formed as a GUTTER — leads water from the roof surface above past the window

Use the window manufacturer's system flashings for coverings on counter battens and battens. Snow melts on the glass and freezes on the Solskifer below — choose a window with good insulation (triple glazing); do not place roof windows where structures higher up cause snow drifts. Roof windows are not used on roofs shallower than the minimum pitch for the covering (15°).

D8 Snow guard — section

Lobas S-606 with GG-11 grating rail or equivalent. Brackets at cc 750 mm in the middle of the panel in the row below, so the panel joint in the row above lands directly over the bracket foot — roughly directly above the external wall.



1. GG-11 grating rail
2. Snow guard bracket (Lobas S-606, 585 mm) — cc 750 mm, the foot in the middle of the panel in the row below; the stem passes up through the panel joint in the row above and beneath the next row to the board
3. Thin rubber gasket where the bracket is in contact with glass — the clearance in the panel bracket gets tight with gasket under and over the foot
4. Solskifer panel — first row above the snow guard: trim a little off the rubber strip under the panels
5. Fixing board 28 × 120 mm — 18 cm above the batten, top edge to top edge
6. Row above — the section runs through the panel joint: the two panels appear as edges, the bracket passes up between them; their panel brackets sit to the side of the joint
7. Batten 36 × 48 mm — the bracket passes over the batten in the panel joint

The brackets are placed in the middle of the panels in the row below, roughly directly above the external wall, so the panel joint in the row above lands directly over the bracket foot. Place a thin rubber gasket wherever the bracket touches the glass. Where the eaves have a corner panel or half foot panel, cut away a piece of the foot so the glass above clears it; if the foot is to lie flat on the guide batten of an abutment gutter, cut off the hook at the top of the foot.

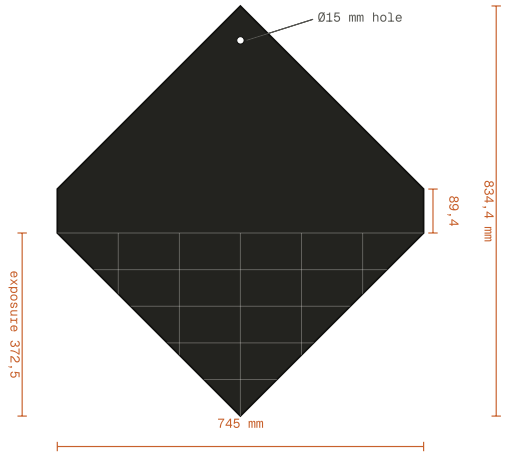
05 The material

Solskifer is laminated from two layers of 4 mm toughened glass with laminated-in solar cells.

P The panel — geometry

Portrait-format hexagon in laminated toughened glass, seen from the printed side.

Width	745 mm
Height	834,4 mm
Straight sides	89,4 mm
Exposure	372,5 mm
Glass	2 × 4 mm toughened
Weight	7.5 kg



The exposure of 372,5 mm equals both the batten spacing (cc 375 mm) and the roof-width module (0,375 m) — which is why the panels are laid in a nested diamond pattern. The upper part is covered by the row above and has no solar cells. The rail on the back of the panel sits at the widest part, at mid-height — the panel hangs by its middle on the batten.

Toughened, laminated glass is very strong, but should be handled with care. Avoid contact with sharp or hard objects, especially against the panel's edges and corners.

> GLASS NEVER DIRECTLY AGAINST METAL
>
> Glass must never be in direct contact with screws, washers or other metal — with the exception of flashings laid on or directly beneath the Solskifer roof.

Active and passive panels, adaptation plates

Solskifer is supplied as *active panels* (with solar cells) and *passive panels* (the same glass panel without cells — used in edge zones, terminations and where active panels are not appropriate). *Adaptation plates* are not glass but aluminium composite (ACP: aluminium – core – aluminium), cut, drilled and screwed with ordinary carpentry tools — against gutters, flashings and penetrations.

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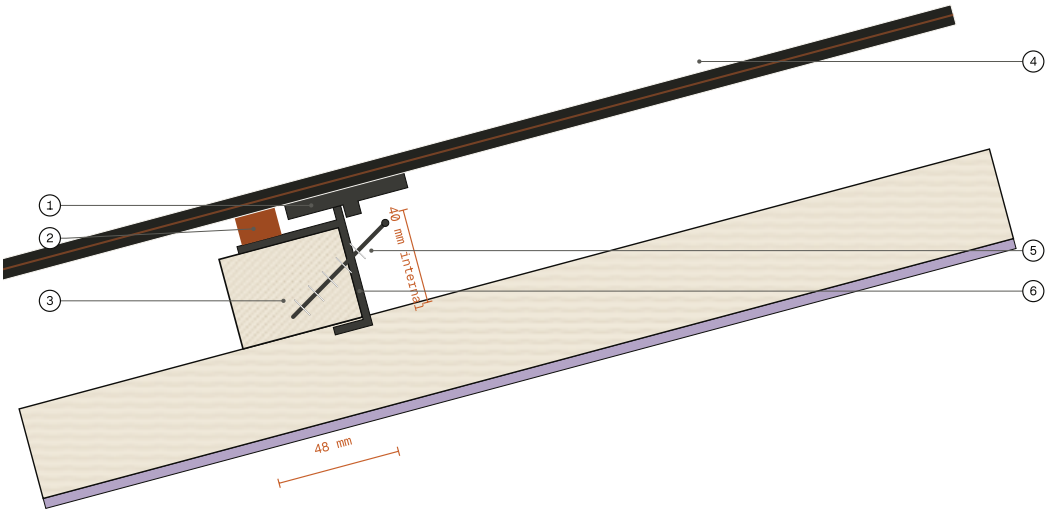
06 Bracket and fixing

The brackets slide onto the rail on the back of the panel and are adjusted as wide as possible — without conflicting with the counter battens. The rail sits at mid-height of the panel, so the panel hangs by its middle on the batten: the upper half lies beneath the row above.

D7 **Bracket and fixing — enlarged section**

The bracket slides onto the rail on the back of the panel, hooks over the batten from the ridge side and is screwed into the batten's ridge-side face. Adjusted as wide as possible — without conflicting with the counter battens. Shown at 15° roof pitch.



1. Rail (support profile) on the back of the panel — at mid-height of the panel, at its widest part
2. Rubber gasket against the glass
3. Batten 36 × 48 mm on counter batten
4. Solskifer panel — 2 × 4 mm laminated toughened glass
5. A4 stainless (acid-proof) screw 5 × 45 mm — through the leg from the ridge side, at an angle down into the batten
6. Bracket 60 mm — plate on top of the batten, leg down the ridge-side face and lip beneath (40 mm internal); the lip passes between the counter battens

Glass must never be in direct contact with screws, washers or other metal — with the exception of flashings laid on or directly beneath the Solskifer roof. Panels and edge plates in the edge zones are screwed down as you go. An extra-long bit holder, or an angled one, makes the screwing easier.

- Panels and edge plates in the edge zones are screwed down.
- The edge zones are screwed as you go: 60 mm brackets with holes, fixed to the batten with a 5 × 45 mm A4 stainless (acid-proof) screw. The bracket grips around the batten, and the screw is driven from the ridge side at an angle down into the batten (D7).
- An extra-long bit holder, or an angled one, makes the screwing easier.

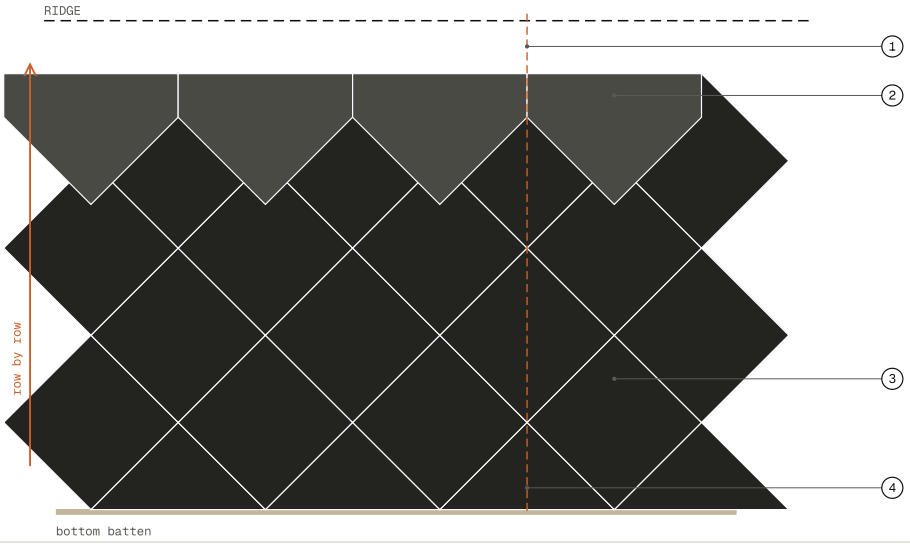
The top row of half panels (ridge tiles) has a clip glued under the lower end. Push the clip between the panels in the row below before the 60 mm bracket is screwed to the batten. Top corners out towards the valley gutter/verge are aligned at the same angle as the rest of the Solskifer roof, with guide clips that grip around the panel below before screwing.

07 Laying Solskifer

Hang the foot panels along the bottom batten, then lay row by row — or diagonally at 45°.

L Laying — nested diamond pattern

Hang the foot panels along the bottom batten. Mark a square line and repeat it for control.



1. Control line (square line) — e.g. every 75, 150, 225 or 300 cm
2. Ridge tile (half panel) with glued-on clip — pushed between the panels in the row below
3. Whole panels — row by row upwards, or diagonally at 45°
4. Foot panel — hung along the bottom batten, first

Connect the cables as you go and cable-tie the connections to a batten, up off the underlay. The supply lines must be in place before laying starts.

The sequence

1. Mark out a square line where the edge of the foot panel will sit, and carry it up the whole roof surface.
2. Repeat the line as often as you need to stay in control — e.g. every 75, 150, 225 or 300 cm.
3. Hang the foot panels along the bottom batten.
4. Lay Solskifer row by row (or diagonally at 45°).
5. Connect the cables as you go and cable-tie the connections to a batten, up off the underlay.

> SUPPLY LINES FIRST
>
> The supply lines must be in place before laying of Solskifer starts.

08 Roof width and distribution

Aim for a roof width matched to the nominal dimensions. Always start at the centre and mark cc 375 mm out to each side.

Distribution principle: centre line, whole panels out to each side, remainder towards the valley gutter/flashing with overlap.

Worked examples

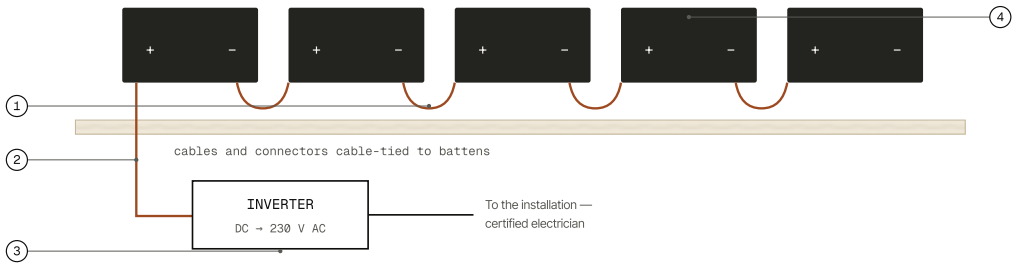
13 m	13 / 0,375 = 34,67 → 34/2 = 17 whole panels per side. Remainder 0,67 × 0,375 = 0,25 m / 2 = 0,125 m valley gutter/flashing per side + overlap. Start at the centre, mark 375 mm.
14 m	14 / 0,375 = 37,33 → 37/2 = 18 whole panels + a corner. Remainder 0,33 × 0,375 = 0,125 m / 2 = 0,0625 m per side. Start at the centre, mark 187,5 mm, then 375 mm.
11,5 m	11,5 / 0,375 = 30,67 → 30/2 = 15 whole panels per side. Remainder 0,67 × 0,375 = 0,25 m / 2 = 0,125 m valley gutter/flashing per side + overlap. Start at the centre, mark 375 mm.

09 Electrical

Each panel is connected in series with the previous and the next. The direct current is collected in strings and led to the inverter.

E Electrical — series connection

Each panel is connected in series with the previous and the next. The direct current is collected in strings and led to the inverter.



1. Series connection — cables and connectors are cable-tied to battens, kept away from the underlay and moisture
2. String to the inverter's MPPT — designed from the theoretical voltage; follow the string plan
3. Inverter DC → 230 V AC — positioning and connection by a certified electrician
4. Solskifer panel with + and − (MC4 Stäubli — never "compatible" copies)

All wiring is live as long as light reaches the panel. Use rubber end plugs when terminating a string, isolate + and − from each other, and test in accordance with NEK 400.

- Follow the agreed plan for the wiring runs.
- Each panel is connected in series with the previous/next. Fix the connections to battens, away from the underlay and moisture.
- Use only genuine MC4 Stäubli (PV-KBT4/PV-KST4) — not MC4 plugs from other manufacturers, even if they are claimed to be "compatible".
- The strings are designed from the theoretical voltage — follow the string plan; the design must not be deviated from. A string = series-connected panels = one circuit into the inverter's MPPT.
- Never connect + and − of the same string to each other — the plugs have a lock that prevents unintended disconnection.

Inverter

Direct current from the Solskifer roof is collected and led to an inverter that converts it to 230/400 V alternating current, single- or three-phase. Consult an electrician on the type and a sensible location. Always use a certified electrician for connecting wiring and the inverter.

> REMEMBER WHEN TERMINATING
>
> Isolate + and − from each other once the loop is laid. Use rubber end plugs when terminating a loop, or ready-made loops — moisture in the plugs can cause an arc. All wiring is live as long as light reaches the panel.

10 Roof access and completion

Once a panel is properly fitted you can walk on it — but take care.

- Make sure your shoes are clean, with no stones or grit stuck in the soles.
- Try to step directly over where the brackets sit (roughly the vertical centre line of the panel).
- Even so, avoid unnecessary traffic over the panels.
- The panels become very slippery when wet.

> FLASHING WORK AND EXTERNAL SOLUTIONS

> It is the responsibility of the house owner/builder to ensure good solutions for flashing work and external details beyond the Solskifer roof itself. Flashing design and work should be carried out by a tinsmith (sheet-metal worker) or someone with solid expertise in the field.

FINALLY

References and responsibility

- Details D1–D11 are Solskifer's own drawings following the principles in the Byggforskserien design sheets: 525.101 (pitched, ventilated timber roofs with insulated roof surfaces, 2021) and 525.777 (roof windows in pitched, insulated, ventilated timber roofs, 2016); 525.106 (pitched timber roofs with a cold attic, 2020) and 525.779 (raised roof sections and dormers in timber roofs, 2010) were used as references. The sheets belong to SINTEF — consult the originals on byggforsk.no for the full basis, tables and reservations.
- This guide shows the junctions and the ventilation of the counter-batten gap the way Byggforsk draws them, but does not design the roof: structure, the build-up beneath the underlay, insulation, gutters (525.921) and flashings are the installer's responsibility. Always follow the current recommendations from SINTEF and the latest NEK / TEK.
- All electrical connections and wiring runs are made in consultation with the responsible electrician.
- Not every installation option is shown in this guide. The installer is responsible for sound installation.

This guide applies only to the installation of Solskifer roof slates supplied by Solskifer AS.

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CONTACT

Kverndalsvegen 39
2416 Jømna
post@solskifer.no

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