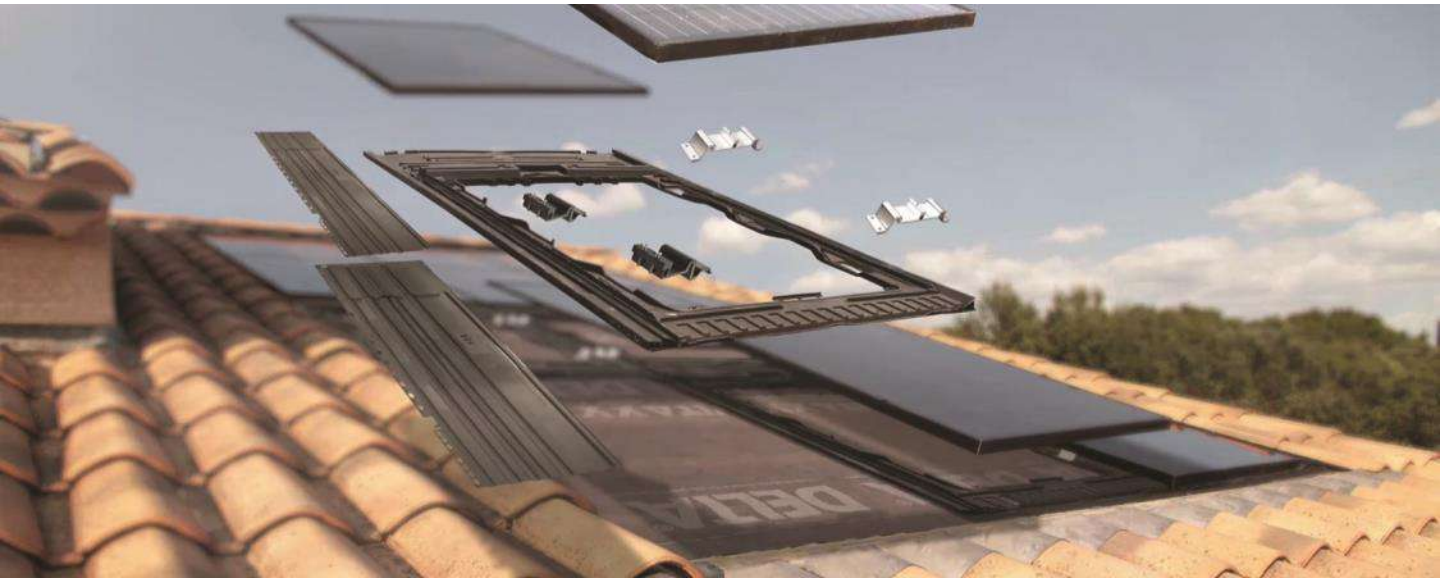
EASY ROOF EVOLUTION

BIPV mounting system

For 60 cells 6 '' PV modules - PORTRAIT

INSTALLATION INSTRUCTIONS
Applicable to frames with a marking "L-1"

INS-IN02-17-0687 – version 2.4 of 2022



Document validated by NEW TECHNICAL INVESTIGATION n° L19.4580

Complies with building integration criteria*
***Except for flat profiled slate and tile roofs, according to the thickness of the tile**

The EASY ROOF system is insured provided that the modules have approvals IEC 61215 and IEC 61730

Compatibility modules : www.edilians.co.uk

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User advice sheet: Use, maintenance and repairs

SMQ-F0-13-180724

Congratulations, you have become the proud owner of an EASY ROOF EVOLUTION system!

With EASY ROOF EVOLUTION you have chosen a practical, reliable and aesthetic solution for your roof photovoltaic project.

For an optimal use of the system , please read and keep the following cleaning and maintenance instructions:

All photovoltaic systems must be regularly monitored and cleaned. To this end, your installer can provide you with a maintenance contract. If you are interested please ask him for details.

All maintenance and repair operations on IRFTS products must be carried out by qualified technicians trained by IRFTS. These operations require electrical and roofing skills.

System maintenance or repair operations must be carried out in compliance with work regulations and in particular regulations for work at height. To avoid putting direct weight onto the modules, do not walk on them. Putting weight on the clamps and fixing brackets is acceptable.

In the case of a maintenance or repair operation that requires the removal of a photovoltaic module, the electric disconnection and reconnection procedure applicable for the replacement of a module must be adhered to.

- **Photovoltaic field maintenance**

At least once a month (before summer to optimise electricity production) as part of the roof maintenance:

- ✓ The photovoltaic modules must be cleaned with a hosepipe (without using pressure or a concentrated stream of water)
- ✓ Visual inspection, spotting damage
- ✓ Waterproofing check: check the condition of the different waterproofing elements, that the water runs freely through the flashing channels. If necessary, clean the channels.
- ✓ Check the wiring
- ✓ Check the fixing points: check that all the screws and bolts are present and properly fixed in place

- **Electrical maintenance**

If, once the real amount of sunshine has been taken into account, a measurable reduction in yearly production from one year to the next is observed, the inverter and the individual modules should be checked to see if they are working properly.

- **Module replacement**

If the glass of the photovoltaic panel or the panel itself is damaged, please follow this procedure:

1. Disconnect the inverter (s) from the network by opening the AC circuit breaker located between the inverter (s) and the meter.
2. Disconnect the photovoltaic field by opening the DC switch/breaker located between the modules and the inverter. If the system is equipped with micro-inverters they automatically disconnect the photovoltaic field after step 1.
3. Dismantle the parts of the assembly system in reverse installation order to gain access to the module's wiring. Never withdraw the connectors in the rain.
4. Assemble the new module in compliance with its installation instructions (see *Installation instructions*) Reconnect the equipotential connection to the new installed module.
5. Check that the modules concerned are working properly:
    a. Measure their open-circuit voltage range
    b. Check the compatibility of this range with the inverter's input range
6. Reconnect the photovoltaic field by closing the DC switch/breaker (except if there are micro-inverters), then the AC circuit breaker.

1) Nomenclature

1.1)

Parts provided in the kit		
Number	Designation	Code Article
1	Frame L-1 Evolution	P001LV42...(*)
2	Left flashing L-1 Evolution	P002LV40...(*)
3	Right flashing L-1 Evolution	P003LV40...(*)
4	End clamp Evolution	A001V40
5	Middle clamp Evolution (1)	A002V41
6	Middle clamp (Large) Evolution (1)	A009V40
7	Middle bracket Evolution	A004V40
8	End bracket Evolution	A003V40
9	A2 Stainless steel rounded screw 6x40	V003V02
10	Clamp screw M6x 40 stainless steel A2 (module 40 to 50mm) (2)	V013V02
11	Clamp screw M6x 30 stainless steel A2 (module 40 to 50mm) (2)	V012V02
12	Mounting tool EASY ROOF L-1, O-1, P-1	OUT0P00765AA
Optional parts		
13	Middle clamp black Evolution (1)	A002V41N
14	Middle clamp (Large) black Evolution (1)	A009V40N
15	End clamp black Evolution	A001V40N
16	End bracket black Evolution	A003V40N
17	Side frieze	F001V40
18	EASY GROUNDING	PRT0P00340AA
19	Flashing aluminium Left Right	PRT0P00556AA
20	Simple aluminium Flashing L/R L-1/O-1	PRT0P00692AA

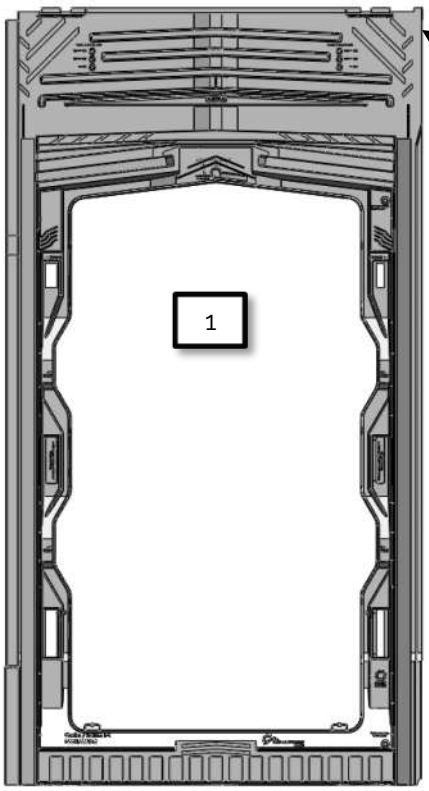
* : Codification can change according to the choice of material

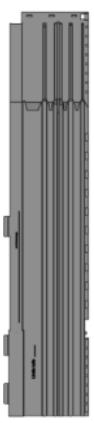
1.2)

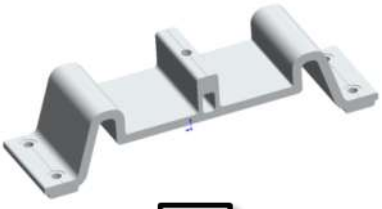
Parts not provided in the kit	
Number	Designation
a	Counter sunk head screw six lobes 5x60 stainless steel A2 (wood)
b	Rounded head screw six lobes 5x30 stainless steel A2 (flashings)
c	Bottom flashing
d	Batten 120x27 (3)
e	Batten 30x27 (3)
f	Batten 40x15 (create a belever) (4)
g	Batten 150x18 (4)
k	Batten 180x18 (Bottom flashing) (4)
m	Bottom metal flashing (5)

(1) Use large clamp for PV modules width lower than 992 mm.
(2) Choose the length of screw to be used according to the PV module thickness .
(3) Dimensions of these support batten can vary according to the design of the roof structure and the geographical zone of the building site, see table p. 21 to 24. These support batten will have to be same thickness as the tiles batten .
(4) Dimensions of this bottom flashing batten can vary according to the roof slope , see table p. 26.
(5) For installation at the gutter.

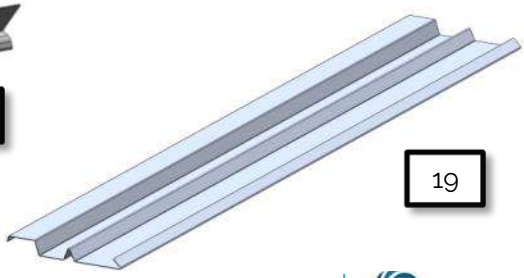
1.3) Parts representation







Optional parts



2) EASY ROOF EVOLUTION with GLAZING STOPS AND DEFLECTORS

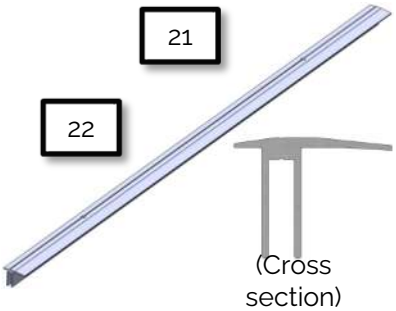
2.1) Parts List

Assembly with deflectors and glazing stops		
Parts supplied in the kit		
Number	Description	Code Article
19	Cap head screw M4 x 35 TX 20 stainless steel A2	V085V02
20	Deflector clamp	A033V40
21	Deflector	A032V40
23	Middle glazing stop	A012V41
25	Side glazing stop	A015V41
27	Glazing stop blanking cover	PRT0P00412AC
29	Socket headed screw CHC M5x35 Stainless steel A2	V001V02
30	Blanking cover bolt	A034V40
31	Glazing strop mounting tool L-1	OUT0P00544A

Optional parts		
22	Black deflector	A032V40N
24	Black Middle glazing stop	A012V41N
26	Black side glazing stop	A015V41N
28	Black glazing stop blanking cover	PRT0P00412NAC

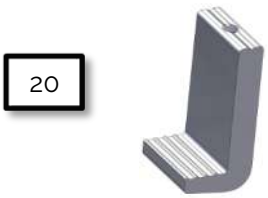
2.2) Representation of parts

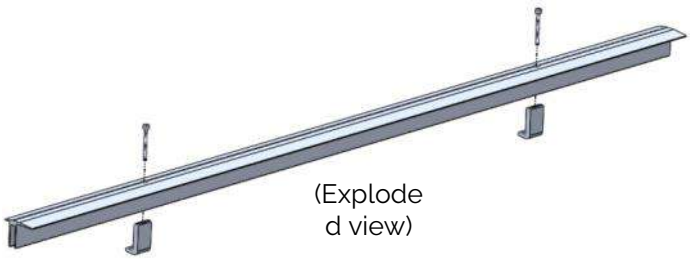
- Deflector: part that is assembled at a right angle to the roof slope where two modules join.



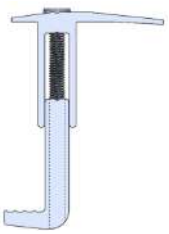
(Cross section)

- Deflector clamp: part that is used to clamp the deflector onto the PV module





(Explode d view)

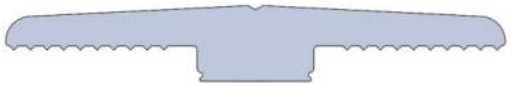


These three components are delivered separately
Pre-assemble the deflector before starting work as shown

2) EASY ROOF EVOLUTION
with GLAZING STOPS AND DEFLECTORS

2.2) Representation of parts

- Middle glazing stop: part that is assembled in the same direction as the roof slope where two modules join



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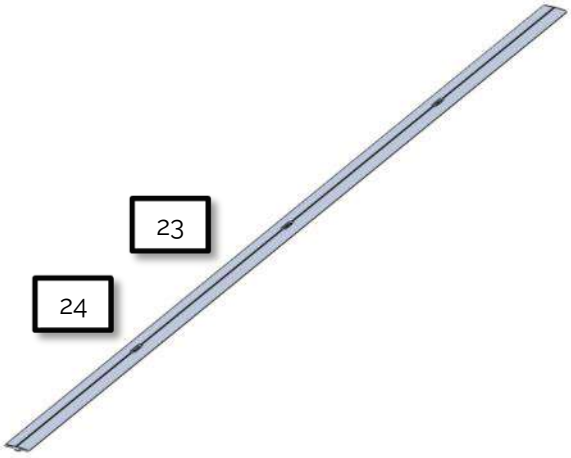
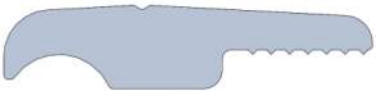
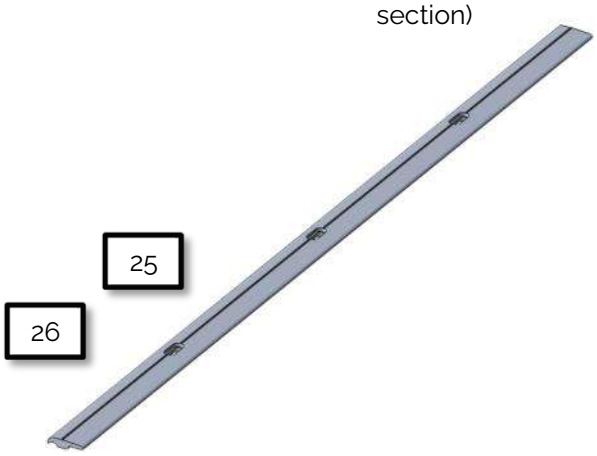


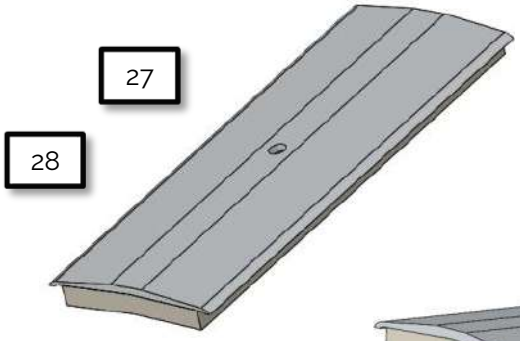
- Side glazing strop: part that is assembled in the same direction as the roof slope on each side of the PV field

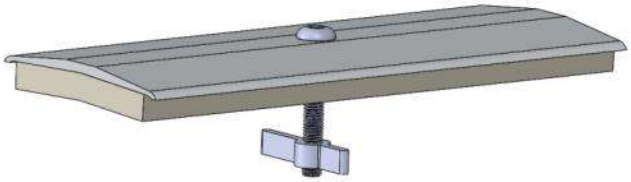


(Cross section)



- Glazing stop blanking cover: part that is assembled in the same direction as the roof slope where two glazing stops meet





These three components are delivered separately
Pre-assemble the blanking cover before starting work as shown

- Glazing stop mounting tool L-1: Tool to ensure that the brackets are installed vertically

See Assembly Annexe 6 - page 75

3) EASY ROOF EVOLUTION on SLATE roofs with METAL FLASHING

Metal flashing is made to order and is not included

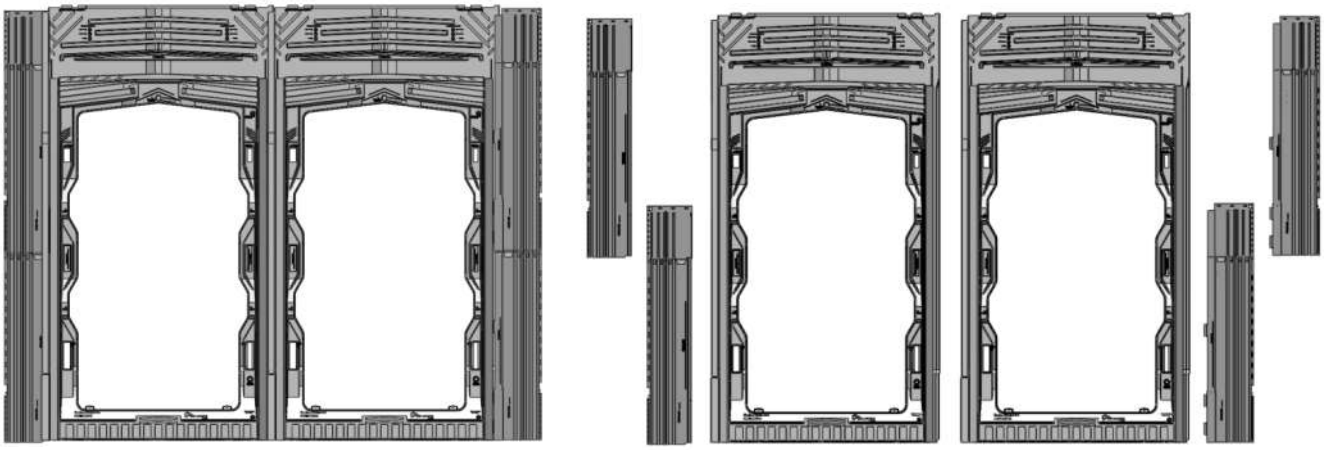
⇨ See Diagrams and Assembly Annexe 8 - page 86

4) EASY ROOF EVOLUTION on TILED roofs (minimum 30mm curve) with METAL FLASHING

Metal flashing is either made to order or included

⇨ See Diagram and Assembly Annexe 9 - page 107

1.4) 2 lateral flashings by frame height

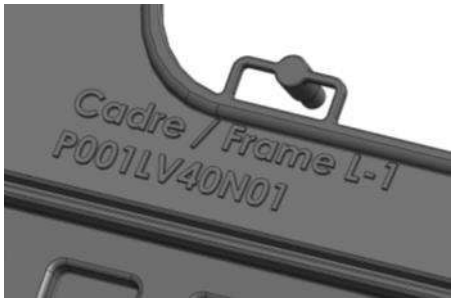


(Exploded View)

5) Parts marking

Marquage des pièces moulées	Définition
P001LV42...(*)	Frame
P002LV40...(*)	Left flashing
P003LV40...(*)	Right flashing

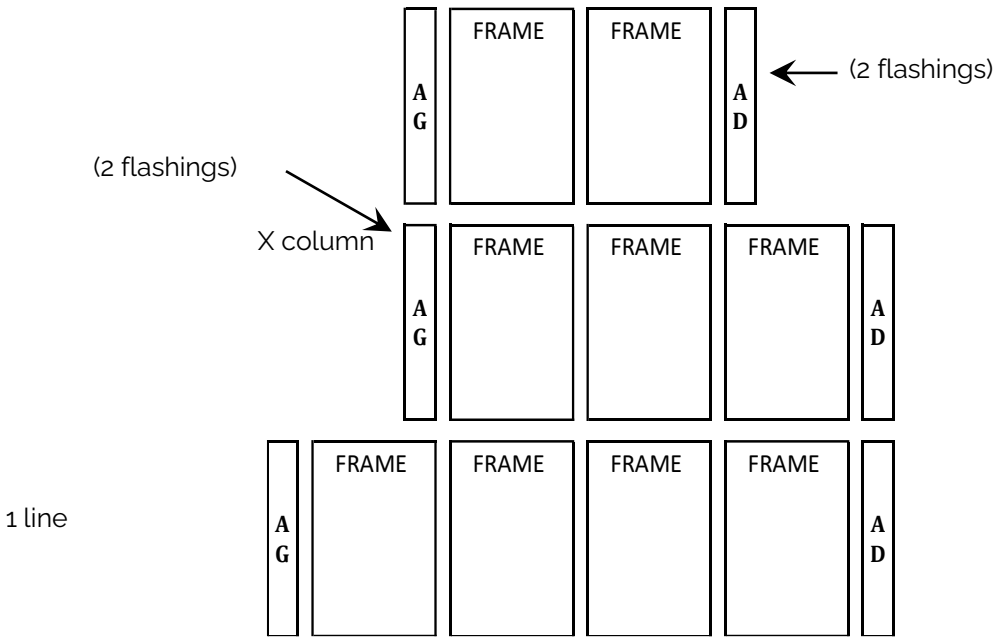
*: Codification varies depending on the choice of material



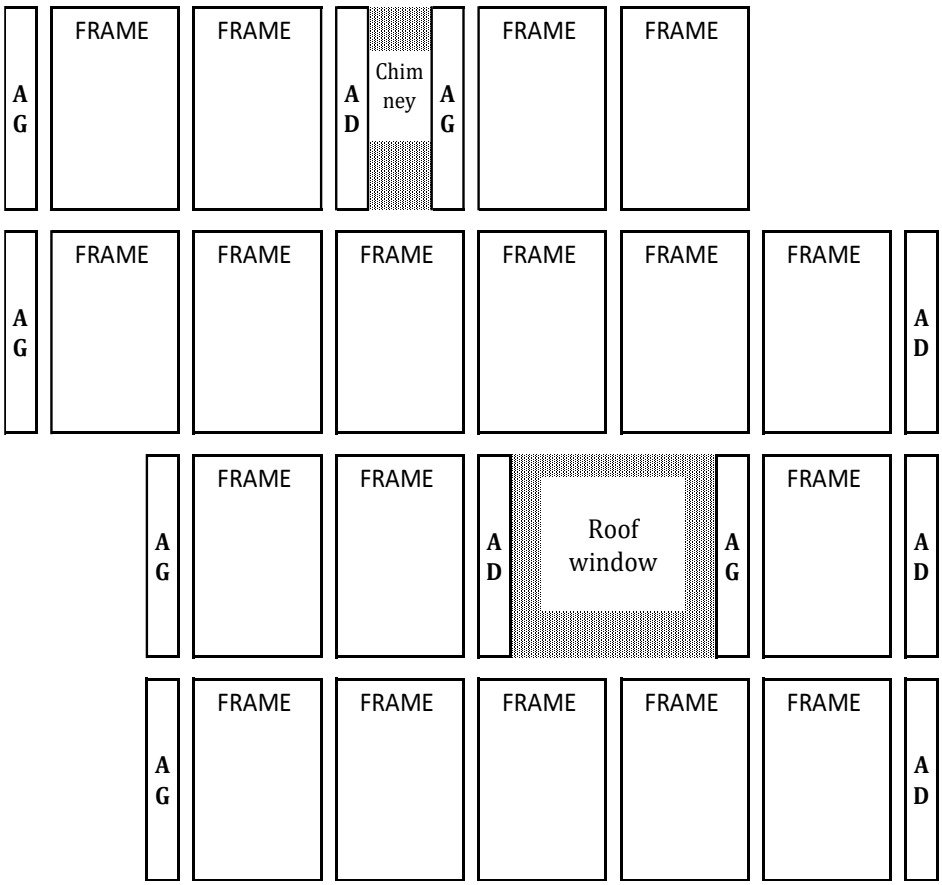
6) Roofing felt / Roofing underlay

We impose the installation of a roofing felt / roofing underlay before the installation of the system of integration EASY-ROOF.
This roofing felt/roofing underlay must comply with regulation

7) Use of different flashings according to the configuration of the photovoltaic field

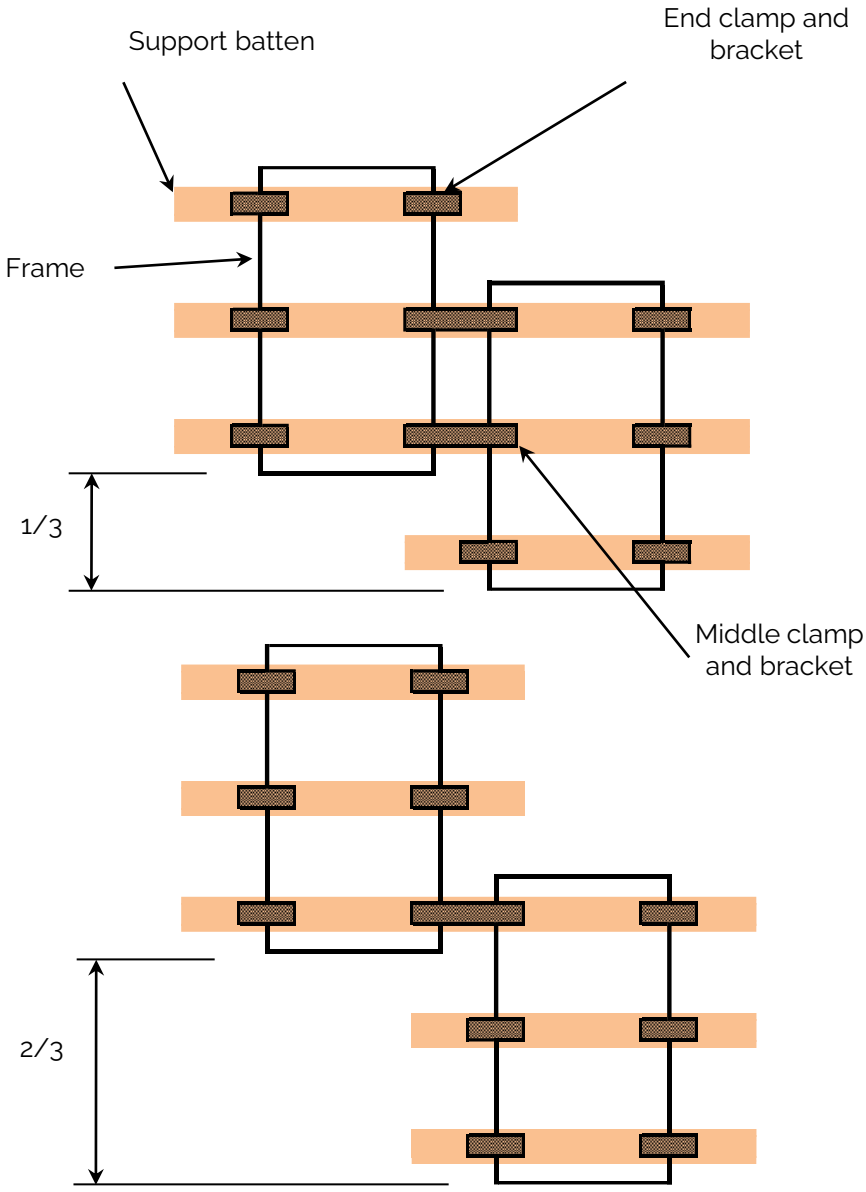


Multiple combination for the clearing of roof window or chimney

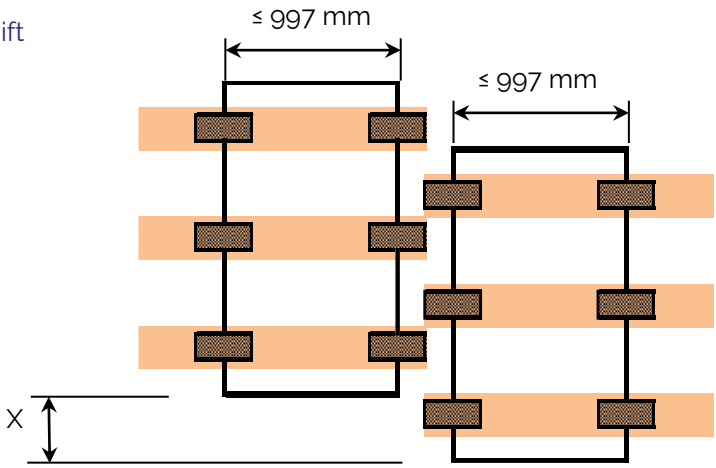


7.1) Possible shift of the panels in the vertical direction

Shift with constant step



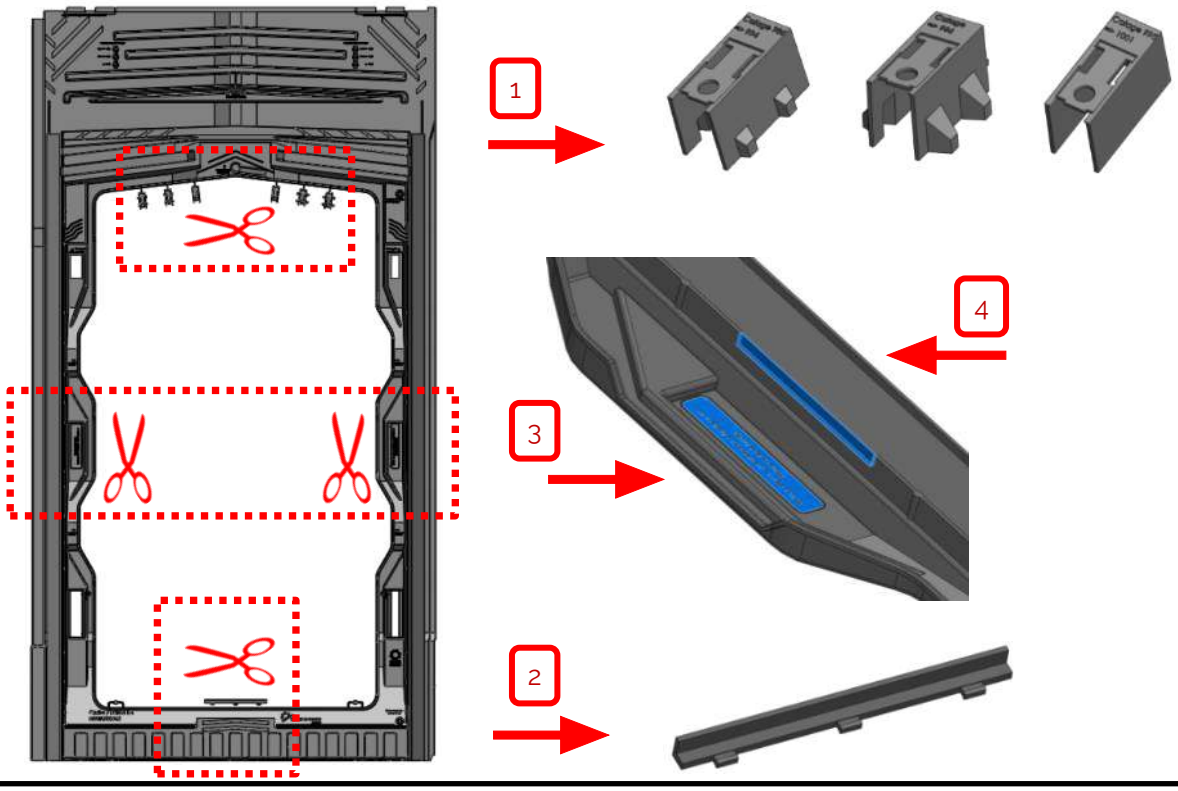
Variable shift



8) Parts to be prepared before assembly of the kit

1°) Preparation of the frames

1°) Remove the 6 module centering wedge
2°) Remove the frieze support
3°) For an installation with 6 fixings per module, cut out and remove the two plugs in the centre of the frame.
4°) For PV modules with a central reinforcement follow the dividing line to remove the reinforcement channel.
(For this type of module check the compatibility list on www.edilians.co.uk)



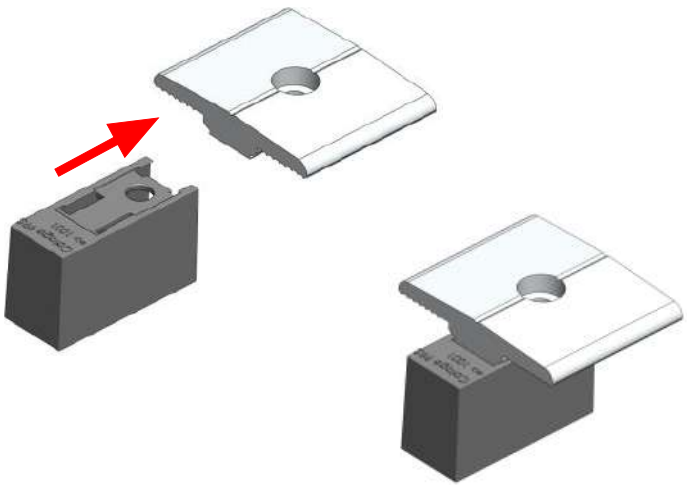
2°) Middle clamp preparation.

Pre mount the module wedge in the slides of each middle clamp (5).
Select the model of module centering wedge according to the module width.
For a module width < to 992 mm, use imperatively large clamp.
If module width = to 992 mm : normal clamp or large clamp. If module width > 992 mm normal clamp.


Module Width ≤ 985


986 ≤ Module Width ≤ 994


995 ≤ Module Width ≤ 1002



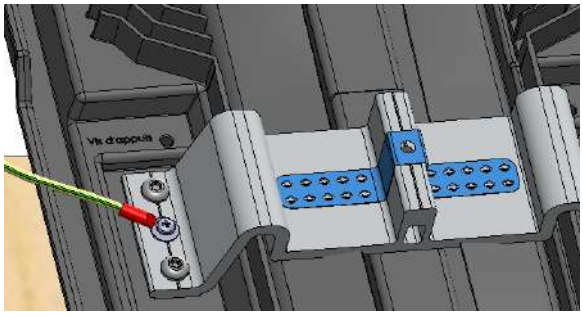
9) Grounding preparation for the PV modules

To ground the PV module, several solutions are possible:

a) Method 1

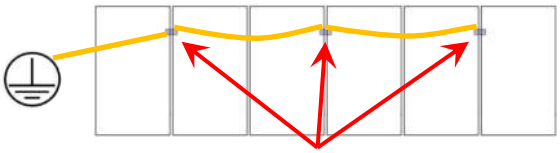
Connect the ground wire to one middle bracket (7) for two PV modules

It is possible to ground both the PV module and the double mounting bracket (7) by using an EASY GROUNDING (www.edilians.co.uk)



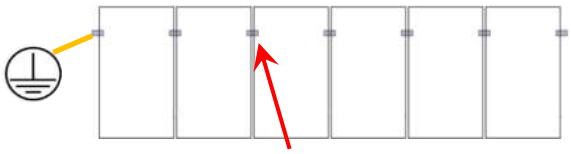
There are two ways of wiring the PV field earth, depending on the regulations in force in the country.

Possibility 1 (France)



one earthing part every two modules

Possibility 2

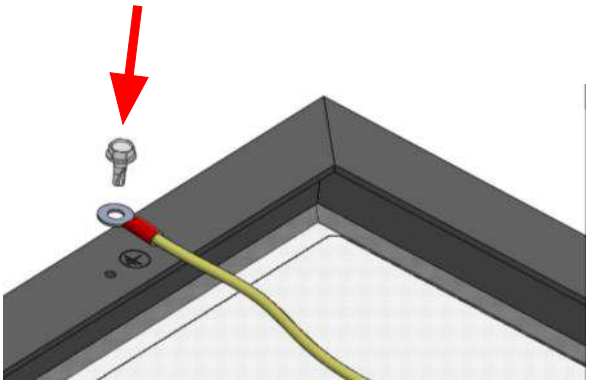


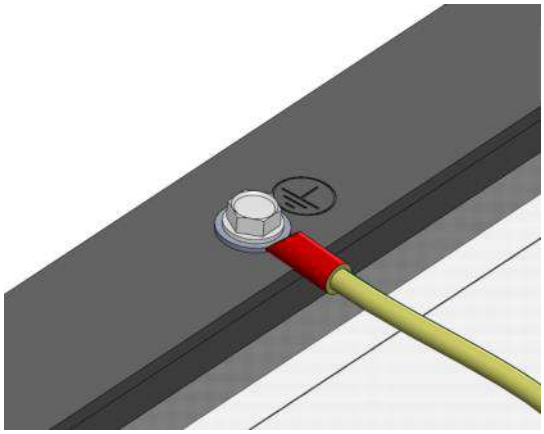
one earthing part on every module

b) Method 2

a) Connect the ground wire directly to the PV module.

Link the PV module directly to the grounding wire using the holes provided by the constructor underneath the module.



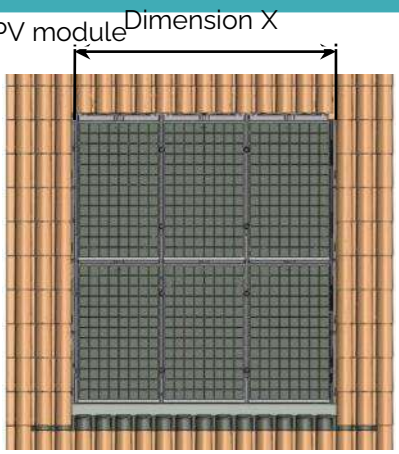


10) Dimension of the PV field (Visible Part of the installation)

1°) Width calculation of the visible field

PV field dimensions	
PV field width (mm)	
PV field centered on the roof	L = 1020 x Nbx + (2 x 20)
Lateral eave installation	L = 1020 x Nbx + (2 x 25)

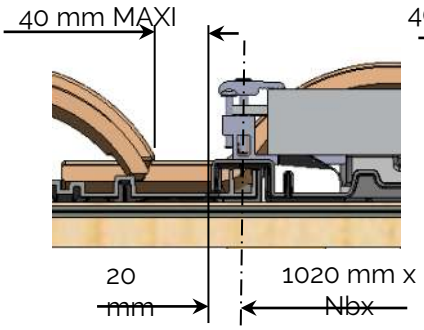
Nbx : Number of column of PV module

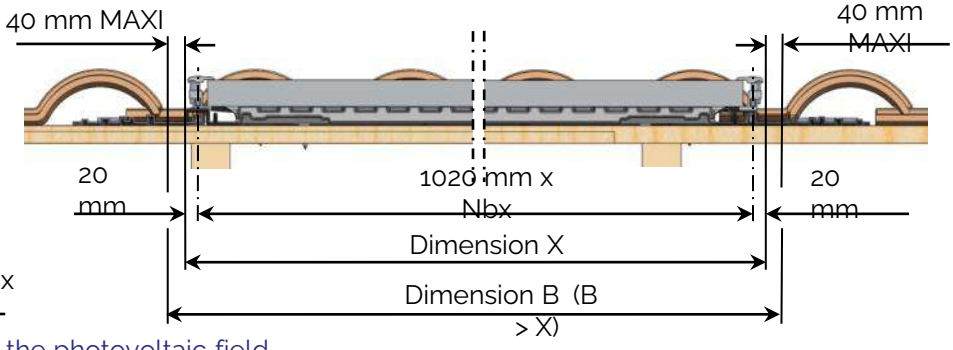


a) Common installation (with tiles on both side)

Ex : (1020 x 12) + (2 x 20)= 12280

Number of PV module in length with standard side flashing															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Dimension X	1060	2080	3100	4120	5140	6160	7180	8200	9220	10240	11260	12280	13300	14320	15340	16360





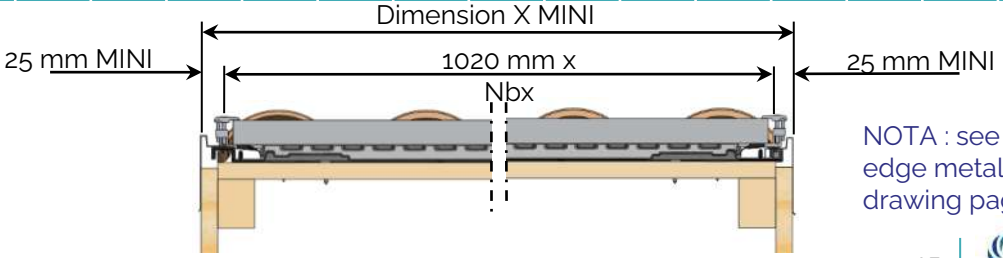
a1) Positioning the photovoltaic field

Dimension B must be positioned with the tiles hollow.

b) Edge installation (no tiles on each side)

Ex : (1020 x 12) + (2 x 25)= 12290

Number of PV module in length for edge installation																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Dimension X MINI	1070	2090	3110	4130	5150	6170	7190	8210	9230	10250	11270	12290	13310	14330	15350	16370



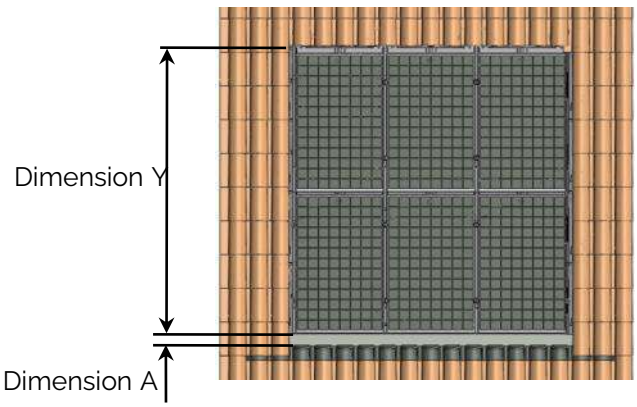
NOTA : see lateral edge metal sheet drawing page 63

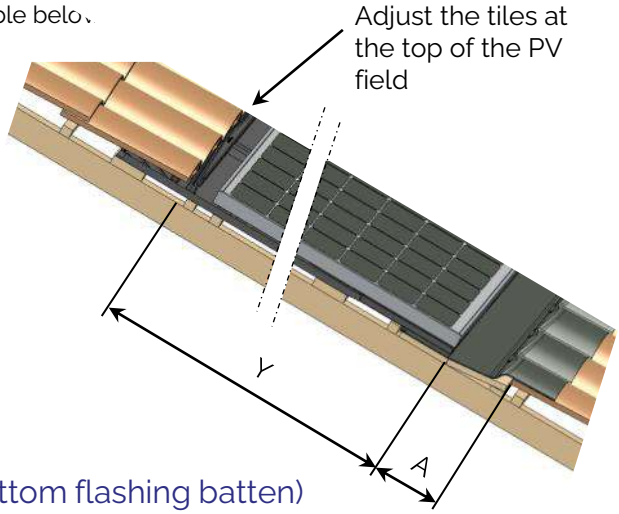
10) Dimension of the PV field (Visible Part of the installatio

2°) Height calculation of the visible field

PV field dimensions	
	PV filed height (mm)
PV field centered on the roof	Y = Pas x (Nby-1) + 1614 + 114
Installation at the gutter	

Step : step of the system in rake direction, see table belo
Nby : Number of line of PV module

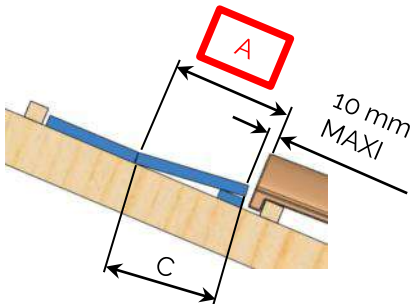




a) Determination of dimension A (Bottom flashing batten)

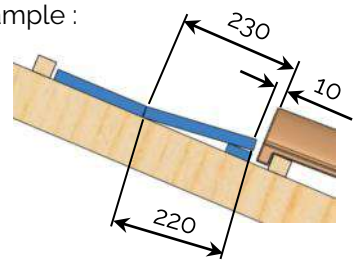
The « C » dimension is the Minimum batten width necessary to avoid reverse slope on the bottom flashing. It's possible to use a widder batten, this will simply raise up the PV field.

Roof slope (°)	Minimum batten width dimensionC MINI (mm)	Dimension A Mini (mm)
10 à 12	250	260
13 à 16	220	230
17 à 19	180	190
20 à 24	150	160
25 à 50	120	130



NOTA : to adjust the tiles at the top of the PV field it might be necessary to increase dimension A in order to move the PV field (See Annex 3 p. 60)

Example :



Dimension of the visible field = Dimension Y + Dimension A

b) Determination of dimension Y

Warning : Check module compatibility on www.irfts.com		Module length(lg)			
		≤ 1645	1646 ≤ lg ≤ 1665	1666 ≤ lg ≤ 1685	1686 ≤ lg ≤ 1705
System vertical step		1655	1675	1695	1715
		Dimension Y			
Modules number in height	1	1728	1728	1728	1728
	2	3383	3403	3423	3443
	3	5038	5078	5118	5158
	4	6693	6753	6813	6873
	5	8348	8428	8508	8588
	6	10003	10103	10203	10303
	7	11658	11778	11898	12018

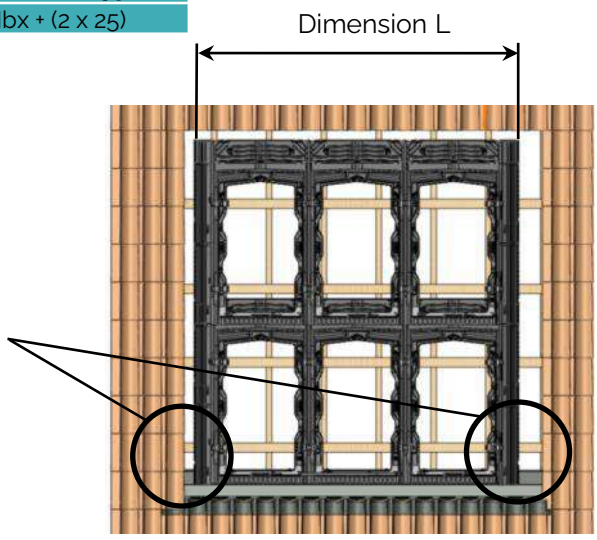
Ex : (1655 x (3-1)) + 1614+114 = 5038

10) Dimension of the Easy-Roof system (With flashings)

1°) Width calculation of the system to be installed

PV field dimensions	
PV field width (mm)	
PV field centered on the roof	L = 1020 x Nbx + (2 x 195)
Lateral eave installation	L = 1020 x Nbx + (2 x 25)

Nbx : Number of column of PV module

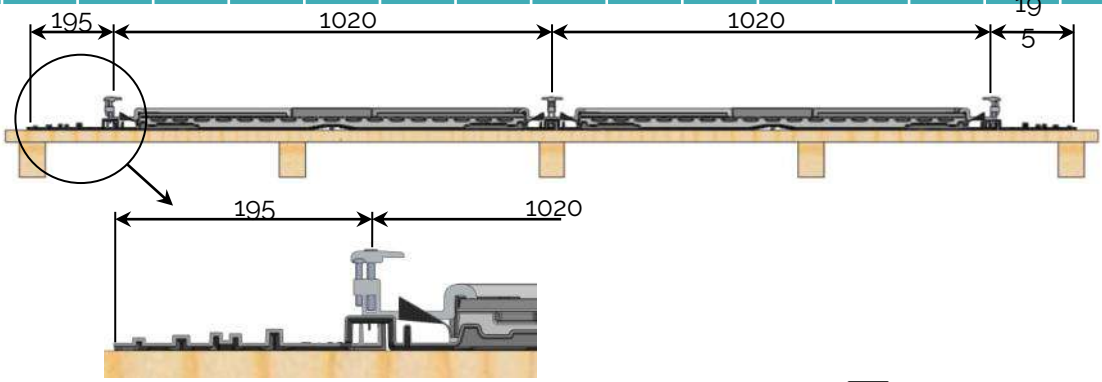


The length of the support batten d* is equal to the dimension L + a sufficient length on each side to lean on the rafter exterior to the frame.

a) Common installation (with tiles on both side)

Ex : (1020 x 12) + (2 x 195)= 12630

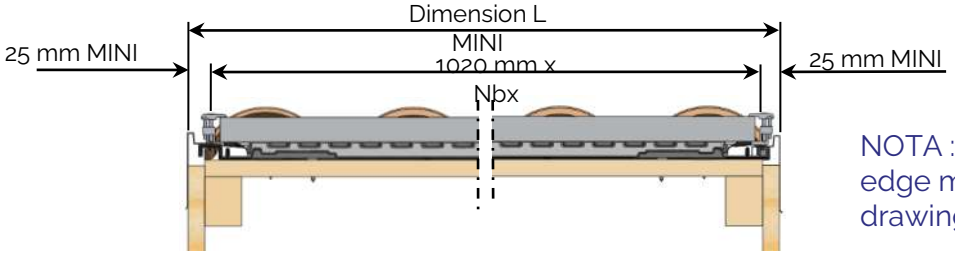
Number of PV module in length with standard side flashing																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Dimension L	1410	2430	3450	4470	5490	6510	7530	8550	9570	10590	11610	12630	13650	14670	15690	16710



b) Edge installation (no tiles on each side)

Ex : (1020 x 12) + (2 x 25)= 12290

Number of PV module in length for edge installation																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Dimension L MINI	1070	2090	3110	4130	5150	6170	7190	8210	9230	10250	11270	12290	13310	14330	15350	16370



NOTA : see lateral edge metal sheet drawing page 63

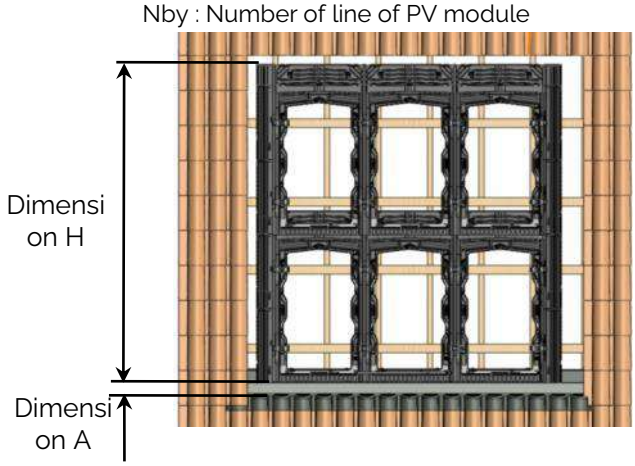
* Reference synopsis

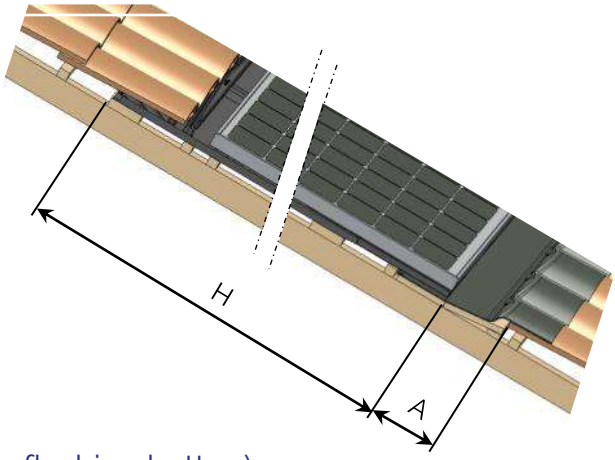
10) Dimension of the Easy-Roof system(With flashings)

2°) Height calculation of the system to be installed

PV field dimensions	
PV filed height (mm)	
PV field centered on the roof Installation at the gutter	H = Pas x (Nby-1) + 1614 + 342

Step : step of the system in rake direction, see table below
Nby : Number of line of PV module

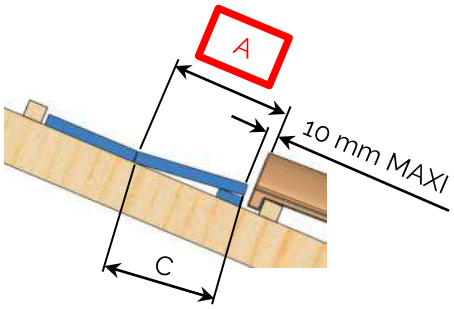




a) Determination of dimension A (Bottom flashing batten)

The « C » dimension is the Minimum batten width necessary to avoid reverse slope on the bottom flashing. It's possible to use a wider batten, this will simply raise up the PV field.

Roof slope (°)	Minimum batten width dimensionC MINI (mm)	Dimension A Mini (mm)
10 à 12	250	260
13 à 16	220	230
17 à 19	180	190
20 à 24	150	160
25 à 50	120	130



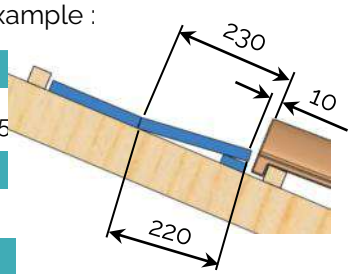
b) Determination of Dimension H

Warning : Check module compatibility on www.irfts.com

		Module length(lg)			
		≤ 1645	1646 ≤ lg ≤ 1665	1666 ≤ lg ≤ 1685	1686 ≤ lg ≤ 1705
System vertical step		1655	1675	1695	1715
		Dimension H			
Modules number in height	1	1956	1956	1956	1956
	2	3611	3631	3651	3671
	3	5266	5306	5346	5386
	4	6921	6981	7041	7101
	5	8576	8656	8736	8816
	6	10231	10331	10431	10531
	7	11886	12006	12126	12246

Ex : (1655 x (3-1)) + 1614+342 = 5266

Example :



Dimension of the Easy Roof system with flashing = Dimension H + Dimension A

NOTA : For an installation at the ridge, it's possible to cut the the frames of the top row by 80 mm MAXI.
(See annex 3 p. 65)

8) Technical definition de l'installation et Support battens definition EASY ROOF

The choice and sizing of the EASY ROOF system support battens is made according to the type and structure of the roof frame destined to receive the integrated system. The EASY ROOF system is installed on roofs with a 10° to 60° slope only. It is mandatory to insert deflectors between modules beyond 50°. The buildings must be enclosed (closed roofs).

Use the tables in the following pages to establish the dimensions of the support battens that you can use for the assembly.

The number of fixing points per PV panel can vary between 4 or 6 depending on the battens that have been chosen for the installation of the PV field and/or the installation zone (edge of roof, marine environment etc.)

The values set out the in the table below apply only to those geographic zones that correspond to 1 to 4 of the snow and wind regulations French Standard NF EN 1991-1-4 and for an altitude of less than 900m. For zone 5 a technical and feasibility study must be carried out on a case by case basis.
It is essential to adhere to the sizing instructions. A sizing software MY SOLAR PROJECT is available on the site IFRTS (www.edilians.co.uk).

For roofs with a continuous batten, an anti-abrasion underlay that is compliant with the DTU (Construction Unified Codes of Practice) is mandatory

Please note that the guarantee will only apply if the installation has been carried out in compliance with the rules provided in these instructions and in the different annexes to which they may refer.

For a PV field that is higher than 12m in the direction of the roof slope, horizontal deflectors must be placed (at right angles to the slope) between the PV modules.
For PV fields of 15m and above in the direction of the roof slope, in addition to the required deflectors, the double and single fixing brackets must be replaced by glazing stops that cover the whole length of the PV module with the mandatory addition of blanking covers between the glazing stops (see Annexe 6 page 75).

MODULE COMPATIBILITY

The installer has to ensure that the PV module chosen for the installation is on the compatibility list drawn up by IFRTS (www.edilians.co.uk) and adapted to climatic loads.
If the EASY ROOF system is to be installed on a building by the sea or one used for intensive farming, it is up to the companies installing the system to make sure that all of the parts used in the installation, in particular the termination system, are compatible with either salt-spray exposure or an ammonia filled environment.
In particular, the modules must be validated according to French standards NF EN 61701 and NF EN 62716.
The assembly instructions of the photovoltaic module manufacturer must be respected. It is up to the installer to check that the photovoltaic module manufacturer's requirements are respected during the mounting of the said module into the assembly system that is the subject of the present instructions.

TRAINING

EDILIANS recommends and offers an "installer" training course, provided by itself or another company.
This training course covers the installation of the EASY ROOF system as well as all aspects relating to safety (work at height, electrical safety).
A roof structure at ground level enables the different elements of the installation to be presented and allows the participants to work under real-life conditions according to the technical regulations in force. It also serves to highlight awareness of the dangers inherent to this profession and of the importance of following safety regulations.

SAFETY INSTRUCTIONS

Before carrying out any work on a installation, appropriate safety measures for working at height must be put in place such as, accident prevention measures using CPE or PPE for each worker.

INSTALLER QUALIFICATIONS

To become an EASY ROOF system installer you must be a professional with roofing and electricity expertise corresponding to the French designations QUALIPV BAT and ELEC.

FIELD OF USE

Installation:

- Rural non-polluted, normal or heavy industrial or marine environments.
- On insulated or non-insulated buildings, exclusively on a cold roof
- Only in places with low or intermediate humidity, in a healthy environment.
- Use up to Seismic Zone 4 for Category IV buildings.
- Whole or partial roof installation.
- The length between the bottom of the PV field and the roof ridge must not be more than 12m (discontinuous roofing).

PERFORMANCE IN DIFFICULT WEATHER CONDITIONS

- Thephotovoltaic panel structure does not contribute to the stability of the building
- Only the EASY ROOF system (with filling that retains its shape) is appropriate for wind zone 4 and for an altitude of less than 900m for snow loads. The system is valid for normal to 1600 Pascal wind loads and normal to 2400 Pascal snow loads.
- Moreover, it is the installer's responsibility to ensure that the photovoltaic module used is appropriate for the climate loads.
- Any modifications to loads for renovation projects must be studied by a specialist design office in compliance with current calculation regulations. In any event, the solidity of the existing structure must be tested by a certified testing body or by a specialist design office.

ELECTRICAL SAFETY OF THE PHOTOVOLTAIC FIELD

- The electrical standards in force must be complied with. In particular, in France, standards NF C15-100 and NF C-712 are mandatory

- The documentation supplied with the different modules makes it possible to confirm that they comply with French standards EN 61 215 and EN 61 730 (guaranteed electric and thermal performances: category A according to French standard NF EN 61 730 up to 1000 V DC).

- Some of the technical data sheets from module manufacturers mention that the characteristics of the parts can be changed without prior notice. It is the installer's responsibility to ensure that the panels are always category A.

- The photovoltaic modules are equipped with detachable connectors, classed IP65 and category A. The installer will ensure that all PV modules are of the same brand and the same reference.

- So as to guarantee the safety of the roof-integrated photovoltaic field, we recommend the use of PV modules equipped with junction boxes that comply to standard CEI 62790:2014

- Bearing in mind the mention made in the technical data sheets, it is the installer's responsibility to make sure that the category of the equipment and the protection rating are A and IP65 respectively.

EDILIANS REFERENCE DOCUMENTS

The reference documents can be downloaded on this site www.edilians.co.uk

- For assembly on purlinswith a steel or fibre cement roof see document N° " INS-IN02-14-0202 Easy Roof Evolution purlin assembly principle FR model L-1 M-1"

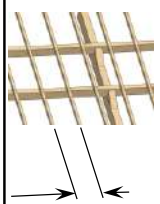
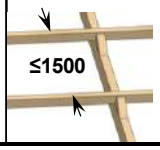
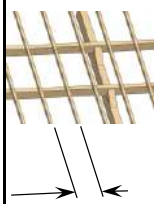
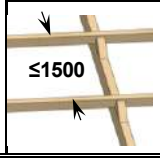
- To integrate a Velux window into the PV field in L-1 see document N° "INS-INO2-14-0213 Easy Roof Evolution FR Velux assembly instructions"
- For an installation with metal flashing see document N° « INS-IN02-160614 Easy Roof Evolution metal flashings for L-1 and O-1 vers.1.0 »

Définition technique
Dimensionnement du support EASY ROOF

11.1) Normal zone, PV field at the lateral edge or angle

Normal

Nota : dimension en mm

			10° to 60° Normal site (catégorie IIIa) 2 roof sides														
			Zone 1				Zone 2				Zone 3				Zone 4				
			Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Counter sunk head stainless A2 Minimum length (screw batten/rafter)
Common area	 Entraxe	Cent. dist. ≤ 600 Cent. dist. rafter	4	15	210	2	4	15	260	2	6	15	220	2	6	15	240	2	5x60/32
			4	22	110	2	4	22	120	2	4	22	150	2	4	22	170	2	5x60/32
			4	27	100	2	4	27	100	2	4	27	100	2	4	27	110	2	5x60/33
			4	40	100	2	4	40	100	2	4	40	100	2	4	40	100	2	5x70/32
		600 < Cent. dist. ≤ 900 Cent. dist. rafter	4	22	150	2	4	22	200	2	4	22	220	2	4	22	250	2	5x60/32
			4	27	100	2	4	27	120	2	4	27	140	2	4	27	170	2	5x60/32
			4	40	100	2	4	40	100	2	4	40	100	2	4	40	100	2	5x70/32
		Cent. dist. ≤ 1500 Metallic rafter	4	40	130	2	4	40	130	2	4	40	130	2	4	40	130	2	Win 6,3x70 (2)
			6	40	100	2	6	40	100	2	6	40	100	2	6	40	100	2	Win 6,3x70 (2)
	 ≤1500	Cent. dist. ≤ 1500 (1) Vertical sarking (3)	4	22	150	3	4	22	150	3	4	22	150	3	4	22	150	3	5x60/32
			4	27	120	3	4	27	120	3	4	27	120	3	4	27	120	3	5x60/32
			4	40	100	3	4	40	100	3	4	40	100	3	4	40	100	3	5x70/32
		Cent. dist. ≤ 1500 (1) wood or metal structure	4	30	150	3	4	30	160	3	4	30	200	3	4	30	220	3	5x60/32
			4	40	100	3	4	40	100	3	4	40	120	3	4	40	130	3	5x70/32
Bottom edge	 Entraxe	**Cent. dist. ≤ 600 Cent. dist. rafter**	**4**	15	250	2	**6**	15	250	2	**6**	15	250	2	**6**	15	260	2	5x60/32
			4	22	130	2	**4**	22	140	2	**4**	22	160	2	**4**	22	180	2	5x60/32
			4	27	100	2	**4**	27	100	2	**4**	27	120	2	**4**	27	120	2	5x60/33
			4	40	100	2	**4**	40	100	2	**4**	40	100	2	**4**	40	100	2	5x70/32
		600 < Cent. dist. ≤ 900 Cent. dist. rafter	**4**	22	170	2	**4**	22	200	2	**4**	22	250	2	**4**	22	270	2	5x60/32
			4	27	120	2	**4**	27	140	2	**4**	27	160	2	**4**	27	180	2	5x60/32
			4	40	100	2	**4**	40	100	2	**4**	40	100	2	**4**	40	100	2	5x70/32
		Cent. dist. ≤ 1500 Metallic rafter	**4**	40	130	2	**4**	40	130	2	**4**	40	130	2	**4**	40	140	2	Win 6,3x70 (2)
			6	40	100	2	**6**	40	100	2	**6**	40	100	2	**6**	40	100	2	Win 6,3x70 (2)
	 ≤1500	Cent. dist. ≤ 1500 (1) Vertical sarking (3)	**4**	22	150	3	**4**	22	200	3	**4**	22	220	3	**4**	22	250	3	5x60/32
			4	27	120	3	**4**	27	120	3	**4**	27	150	3	**4**	27	160	3	5x60/32
			4	40	100	3	**4**	40	100	3	**4**	40	100	3	**4**	40	100	3	5x70/32
		Cent. dist. ≤ 1500 (1) wood or metal structure	**4**	30	150	3	**4**	30	180	3	**4**	30	220	3	**4**	30	250	3	5x60/32
			4	40	100	3	**4**	40	100	3	**4**	40	120	3	**4**	40	140	3	5x70/32

(1) : Layout of the battens in the direction of the roof slope

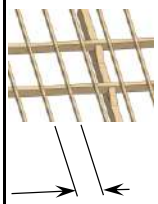
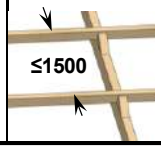
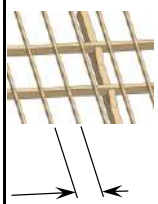
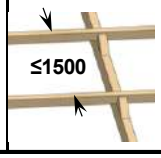
(2) : Wingteks 6,3 x 70 (Référence Etanco : 288 283 ou 288 889).

Technical definition
Support battens definition EASY ROOF

11.2) Normal zone, PV field at the lateral edge or angle

Normal

Nota : dimension en mm

			10° to 60° Normal site (catégorie IIIa) 2 roof sides																Counter sunk head stainless A2 Minimum length (screw batten/rafter)
			Zone 1				Zone 2				Zone 3				Zone 4				
			Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	
Lateral edge	 Entraxe	Cent. dist. ≤ 600 Cent. dist. rafter	6	15	200	2	6	15	220	2	6	15	260	2	6	15	300	2	5x60/32
			4	22	130	2	4	22	160	2	4	22	180	2	4	22	210	2	5x60/32
			4	27	100	2	4	27	110	2	4	27	120	2	4	27	150	2	5x60/33
			4	40	100	2	4	40	100	2	4	40	100	2	4	40	100	2	5x70/32
		600 < Cent. dist. ≤ 900 Cent. dist. rafter	4	22	200	2	6	22	160	2	6	22	180	2	6	22	210	2	5x60/32
			4	27	130	2	4	27	160	2	4	27	180	2	6	27	150	2	5x60/32
			4	40	100	2	4	40	100	2	4	40	100	2	4	40	100	2	5x70/32
		Cent. dist. ≤ 1500 Metallic rafter	4	40	130	2	4	40	130	2	4	40	140	2	4	40	160	2	Win 6,3x70 (2)
			6	40	100	2	6	40	100	2	6	40	100	2	6	40	120	2	Win 6,3x70 (2)
	 ≤1500	Cent. dist. ≤ 1500 (1) Vertical sarking (3)	4	22	150	3	4	22	150	3	4	22	160	3	6	22	150	3	5x60/32
			4	27	120	3	4	27	120	3	4	27	130	3	6	27	120	3	5x60/32
			4	40	100	3	4	40	100	3	4	40	100	3	6	40	100	3	5x70/32
		Cent. dist. ≤ 1500 (1) wood or metal structure	4	30	180	3	6	30	160	3	6	30	180	3	6	30	200	3	5x60/32
			4	40	100	3	4	40	120	3	4	40	140	3	4	40	160	3	5x70/32
Angle	 Entraxe	**Cent. dist. ≤ 600 Cent. dist. rafter**	**6**	15	200	2	**6**	15	250	2	**6**	15	280	2					5x60/32
			4	22	140	2	**4**	22	170	2	**6**	22	160	2	**6**	22	160	2	5x60/32
			4	27	100	2	**4**	27	120	2	**4**	27	140	2	**6**	27	100	2	5x60/33
			4	40	100	2	**4**	40	100	2	**4**	40	100	2	**6**	40	100	2	5x70/32
		600 < Cent. dist. ≤ 900 Cent. dist. rafter	**6**	22	150	2	**6**	22	170	2	**6**	22	200	2	**6**	22	230	2	5x60/32
			4	27	140	2	**4**	27	170	2	**4**	27	200	2	**6**	27	150	2	5x60/32
			4	40	100	2	**4**	40	100	2	**4**	40	100	2	**6**	40	100	2	5x70/32
		Cent. dist. ≤ 1500 Metallic rafter	**4**	40	130	2	**4**	40	130	2	**4**	40	150	2	**4**	40	180	2	Win 6,3x70 (2)
			6	40	100	2	**6**	40	100	2	**6**	40	100	2	**6**	40	120	2	Win 6,3x70 (2)
	 ≤1500	Cent. dist. ≤ 1500 (1) Vertical sarking (3)	**4**	22	130	3	**4**	22	150	3	**4**	22	180	3	**6**	22	250	3	5x60/32
			4	27	100	3	**4**	27	120	3	**4**	27	140	3	**6**	27	160	3	5x60/32
			4	40	100	3	**4**	40	100	3	**4**	40	100	3	**6**	40	100	3	5x70/32
		Cent. dist. ≤ 1500 (1) wood or metal structure	**6**	30	140	3	**6**	30	160	3	**6**	30	200	3	**6**	30	250	3	5x60/32
			4	40	120	3	**4**	40	130	3	**4**	40	150	3	**6**	40	140	3	5x70/32

(1) : Support battens iinstalled vertically.

(2) : Wingteks 6,3 x 70 (Reference Etanco : 288 283 or 288 889).

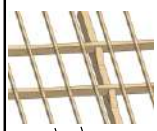
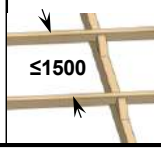
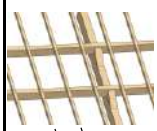
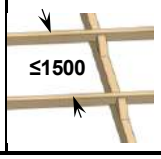
(3) : Support bettens fixed on rafters.

Technical definition
Support battens definition EASY ROOF

11.3) Sea side, PV field centered on the roof or at the gutter

Sea side

Nota : dimension en mm

			10° to 60° exposed site (catégorie I) 2 roof sides														
			Zone 1				Zone 2				Zone 3				Zone 4				
			Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Nbr of bracket	Tile's batten thickness	Support batten mini width	Nbr screw per crossing	Counter sunk head stainless A2 Minimum length (screw batten/rafter)
Common area	 Entraxe	Cent. dist. ≤ 600 Cent. dist. rafter	6	15	220	2	6	15	260	2	6	15	310	2					5x60/32
			4	22	160	2	4	22	185	2	4	22	220	2	6	22	170	2	5x60/32
			4	27	110	2	4	27	120	2	4	27	150	2	4	27	170	2	5x60/33
			4	40	100	2	4	40	100	2	4	40	100	2	4	40	100	2	5x70/32
		600 < Cent. dist. ≤ 900 Cent. dist. rafter	6	22	160	2	6	22	200	2	6	22	220	2	6	22	250	2	5x60/32
			4	27	160	2	4	27	180	2	4	27	220	2	6	27	170	2	5x60/32
			4	40	100	2	4	40	100	2	4	40	100	2	4	40	120	2	5x70/32
		Cent. dist. ≤ 1500 Metallic rafter	4	40	130	2	4	40	140	2	4	40	170	2	4	40	200	2	Win 6,3x70 (2)
			6	40	100	2	6	40	100	2	6	40	120	2	6	40	130	2	Win 6,3x70 (2)
	 ≤1500	Cent. dist. ≤ 1500 (1) Vertical sarking (3)	4	22	140	3	4	22	160	3	4	22	190	3	4	22	220	3	5x60/32
			4	27	110	3	4	27	130	3	4	27	150	3	4	27	180	3	5x60/32
			4	40	100	3	4	40	100	3	4	40	100	3	4	40	100	3	5x70/32
		Cent. dist. ≤ 1500 (1) wood or metal structure	6	30	140	3	6	30	170	3	6	30	200	3	6	30	230	3	5x60/32
			4	40	120	3	4	40	140	3	4	40	170	3	4	40	200	3	5x70/32
Bottom edge	 Entraxe	**Cent. dist. ≤ 600 Cent. dist. rafter**	**6**	15	250	2	**6**	15	300	2	**6**	15	350	2					5x60/32
			4	22	180	2	**4**	22	210	2	**6**	22	160	2	**6**	22	200	2	5x60/32
			4	27	120	2	**4**	27	140	2	**4**	27	160	2	**4**	27	190	2	5x60/33
			4	40	100	2	**4**	40	100	2	**4**	40	100	2	**4**	40	100	2	5x70/32
		600 < Cent. dist. ≤ 900 Cent. dist. rafter	**6**	22	180	2	**6**	22	220	2	**6**	22	250	2	**6**	22	300	2	5x60/32
			4	27	170	2	**6**	27	140	2	**6**	27	160	2	**6**	27	190	2	5x60/32
			4	40	100	2	**4**	40	100	2	**4**	40	110	2	**4**	40	130	2	5x70/32
		Cent. dist. ≤ 1500 Metallic rafter	**4**	40	130	2	**4**	40	160	2	**4**	40	200	2	**4**	40	220	2	Win 6,3x70 (2)
			6	40	100	2	**6**	40	110	2	**6**	40	130	2	**6**	40	140	2	Win 6,3x70 (2)
	 ≤1500	Cent. dist. ≤ 1500 (1) Vertical sarking (3)	**4**	22	150	3	**4**	22	190	3	**4**	22	220	3	**4**	22	250	3	5x60/32
			4	27	120	3	**4**	27	140	3	**4**	27	170	3	**4**	27	200	3	5x60/32
			4	40	100	3	**4**	40	100	3	**4**	40	100	3	**4**	40	120	3	5x70/32
		Cent. dist. ≤ 1500 (1) wood or metal structure	**6**	30	160	3	**6**	30	185	3	**6**	30	220	3	**6**	30	250	3	5x60/32
			6	40	100	3	**6**	40	110	3	**6**	40	125	3	**6**	40	140	3	5x70/32

(1) : Support battens iinstalled vertically.

(2) : Wingteks 6,3 x 70 (Reference Etanco : 288 283 or 288 889).

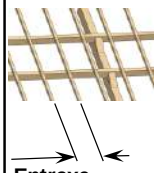
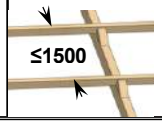
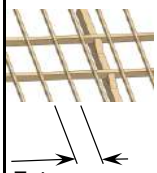
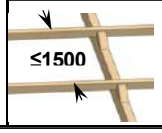
(3) : Support bettens fixed on rafters.

Technical definition
Support battens definition EASY ROOF

11.4) Sea side, PV field at the lateral edge or angle

Bord de mer

Nota : dimension en mm

			10° à 50° site exposé (catégorie I) 2 versants														
			Zone 1				Zone 2				Zone 3				Zone 4				
			Nbre pattes	Epaisseur liteaux	Largeur planche mini	Nbre vis / intersection	Nbre pattes	Epaisseur liteaux	Largeur planche mini	Nbre vis / intersection	Nbre pattes	Epaisseur liteaux	Largeur planche mini	Nbre vis / intersection	Nbre pattes	Epaisseur liteaux	Largeur planche mini	Nbre vis / intersection	Vis tête fraisée Inox A2Longue
Partie courante		Entraxe ≤ 600 Entraxe fermettes ou chevrons	6	15	220	2	6	15	260	2	6	15	310	2					5x60/32
			4	22	160	2	4	22	185	2	4	22	220	2	6	22	170	2	5x60/32
			4	27	110	2	4	27	120	2	4	27	150	2	4	27	170	2	5x60/33
			4	40	100	2	4	40	100	2	4	40	100	2	4	40	100	2	5x70/32
		600 < Entraxe ≤ 900 Entraxe fermettes ou chevrons	6	22	160	2	6	22	200	2	6	22	220	2	6	22	250	2	5x60/32
			4	27	160	2	4	27	180	2	4	27	220	2	6	27	170	2	5x60/32
			4	40	100	2	4	40	100	2	4	40	100	2	4	40	120	2	5x70/32
	Entraxe	Entraxe ≤ 1500 Fermette métallique	4	40	130	2	4	40	140	2	4	40	170	2	4	40	200	2	Win 6.3x70 (2)
			6	40	100	2	6	40	100	2	6	40	120	2	6	40	130	2	Win 6.3x70 (2)
		Entraxe ≤ 1500 (1) Charpente voligée Suivant le rampant (3)	4	22	140	3	4	22	160	3	4	22	190	3	4	22	220	3	5x60/32
			4	27	110	3	4	27	130	3	4	27	150	3	4	27	180	3	5x60/32
	≤1500		4	40	100	3	4	40	100	3	4	40	100	3	4	40	100	3	5x70/32
		Entraxe ≤ 1500 (1) Charpente bois ou	6	30	140	3	6	30	170	3	6	30	200	3	6	30	230	3	5x60/32
			4	40	120	3	4	40	140	3	4	40	170	3	4	40	200	3	5x70/32
Rive basse		Entraxe ≤ 600 Entraxe fermettes ou chevrons	6	15	250	2	6	15	300	2	6	15	350	2					5x60/32
			4	22	180	2	4	22	210	2	6	22	160	2	6	22	200	2	5x60/32
			4	27	120	2	4	27	140	2	4	27	160	2	4	27	190	2	5x60/33
			4	40	100	2	4	40	100	2	4	40	100	2	4	40	100	2	5x70/32
		600 < Entraxe ≤ 900 Entraxe fermettes ou chevrons	6	22	180	2	6	22	220	2	6	22	250	2	6	22	300	2	5x60/32
			4	27	170	2	6	27	140	2	6	27	160	2	6	27	190	2	5x60/32
			4	40	100	2	4	40	100	2	4	40	110	2	4	40	130	2	5x70/32
	Entraxe	Entraxe ≤ 1500 Fermette métallique	4	40	130	2	4	40	160	2	4	40	200	2	4	40	220	2	Win 6.3x70 (2)
			6	40	100	2	6	40	110	2	6	40	130	2	6	40	140	2	Win 6.3x70 (2)
		Entraxe ≤ 1500 (1) Charpente voligée Suivant le rampant (3)	4	22	150	3	4	22	190	3	4	22	220	3	4	22	250	3	5x60/32
			4	27	120	3	4	27	140	3	4	27	170	3	4	27	200	3	5x60/32
	≤1500		4	40	100	3	4	40	100	3	4	40	100	3	4	40	120	3	5x70/32
		Entraxe ≤ 1500 (1) Charpente bois ou	6	30	160	3	6	30	185	3	6	30	220	3	6	30	250	3	5x60/32
			6	40	100	3	6	40	110	3	6	40	125	3	6	40	140	3	5x70/32

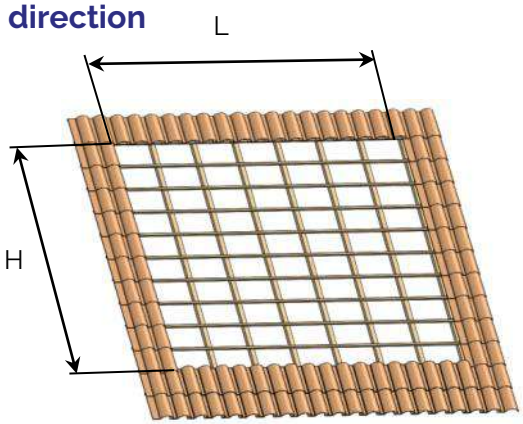
(1) : Calepinage des bois dans le sens du rampant.

12) Instruction for the assembly of the Easy-Roof system

12.1.1) PV field centered on rake direction

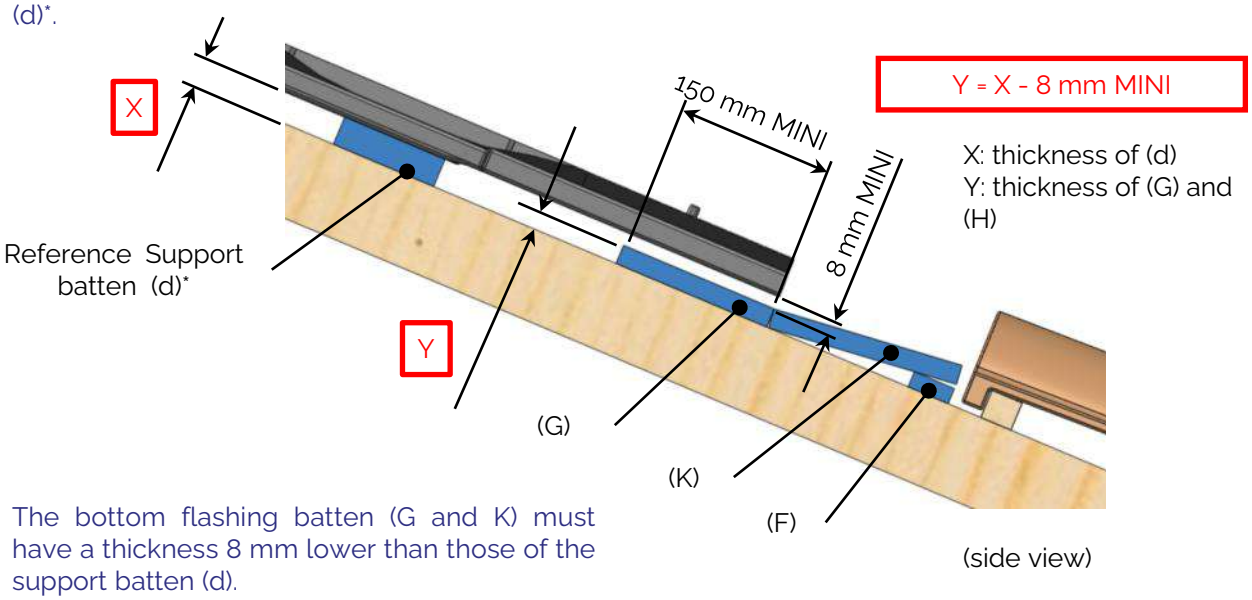
This section of the installation manual relates only to installation of PV field centered in the rake direction. For the installations on the eave go directly on page 28 of this document

Remove the tiles of the photovoltaic field, for L and H to see page 17 and 18



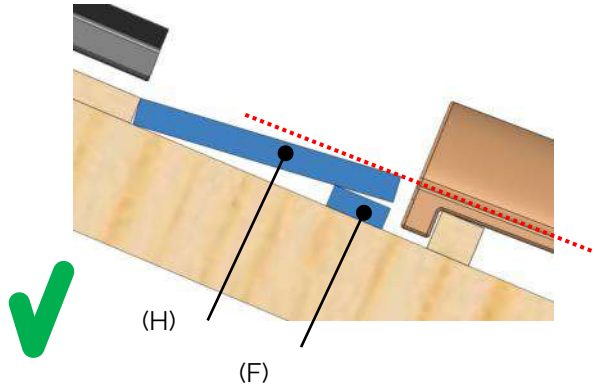
12.1.2) Definition of bottom flashing support batten

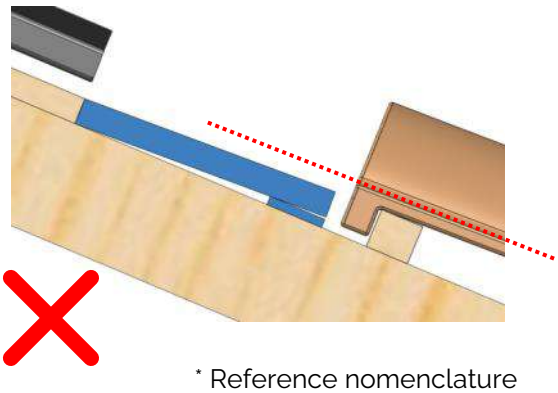
1°) Define the thickness of the bottom flashing batten according to the thickness of the support batten (d)*.



The bottom flashing batten (G and K) must have a thickness 8 mm lower than those of the support batten (d).

2°) Position the batten (F) in order to have the top of the bottom flashing batten (H) flush with the water flow of the tile, eventually slightly higher (a few millimeters).





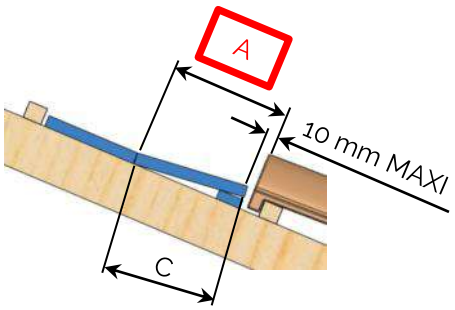
* Reference nomenclature

PV field centered on rake direction

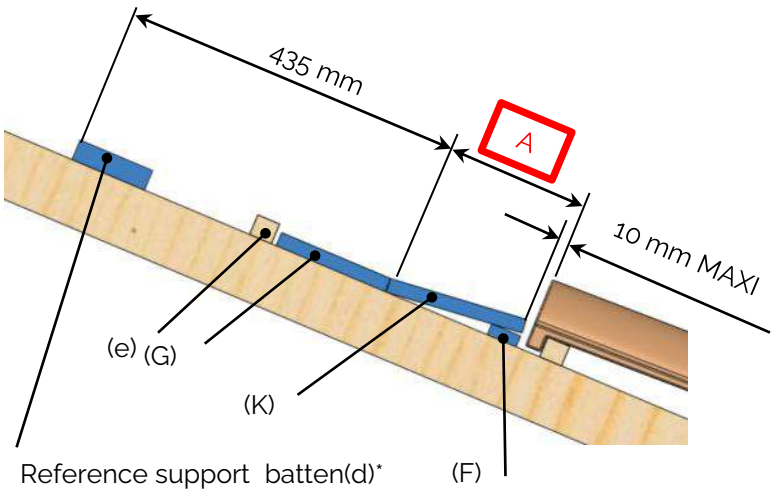
12.1.3) Installation of the bottom flashing support batten and the reference support batten.

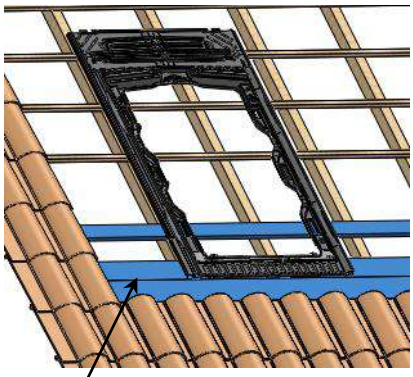
1°) Determination of dimension A (Bottom flashing batten)
The « C » dimension is the Minimum batten width necessary to avoid reverse slope on the bottom flashing. It's possible to use a wider batten, this will simply raise up the PV field.

Roof slope (°)	Minimum batten width dimensionC MINI (mm)	Dimension A Mini (mm)
10 à 12	250	260
13 à 16	220	230
17 à 19	180	190
20 à 24	150	160
25 à 50	120	130



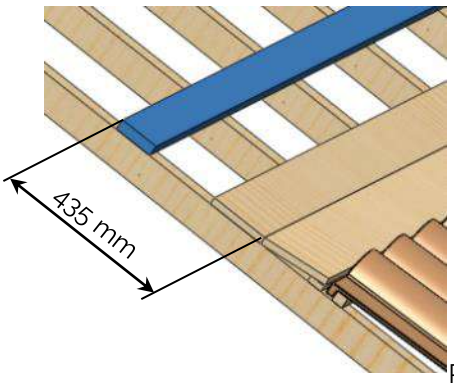
2°) Set up the bottom flashing batten at 10 mm MAXIMUM to the top of the tile . Use the wood (G) and (K) defined in the preceding operation. Put the batten (e) against the batten (g).
Screw with stainless screws 5x60 milled head.



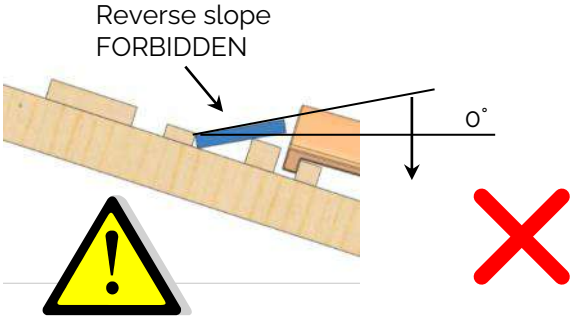


The bottom flashing batten and the bottom flashing itself will have to be 2 tiles longer on each side of the PV field.

3°) Set up the first reference support batten d*. Position this support batten 435 mm to the break of the bottom flashing flooring. (equal to 435mm + A from the top of the tile)
Screw the support batten following the recommendations page 21 to 24 to know the type and the number of screws to be used.



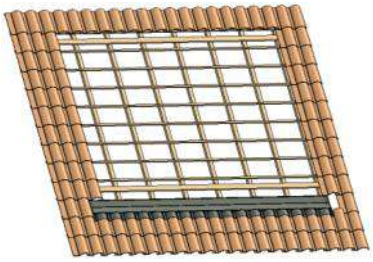
Reference nomenclature



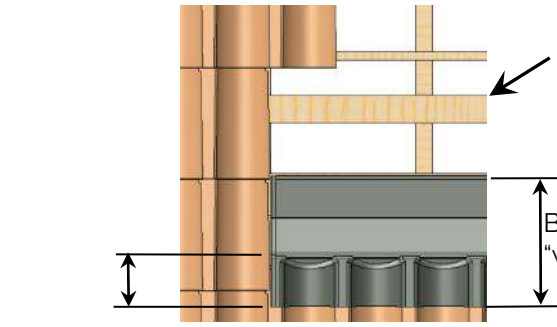
PV field centered on rake direction

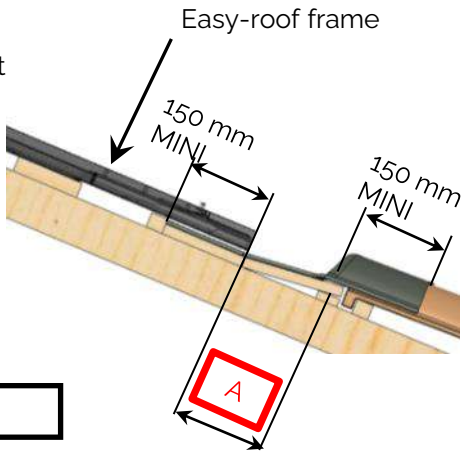
12.1.4) Installation of the bottom flashing

Set up the bottom flashing. Attention not to stick the ends and the higher edge, in order to be able to flip over the ends.
The overlap on the tiles will be made according to the tiles model.



Make sure that the tiles are covered with 150 mm MINI.

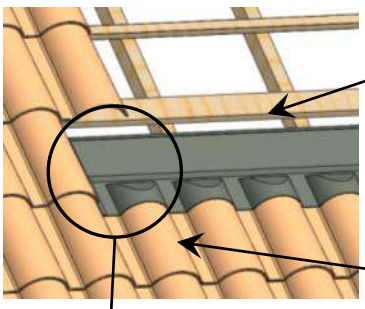


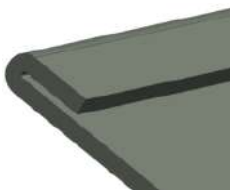


Bottom flashing MINI "width" = (2 X 150) + dimension A

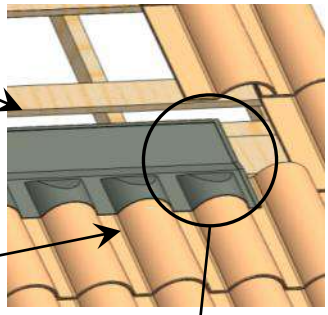
Make a flip over from 10 to 15 mm on the higher edge of the bottom flashing over all the width of the PV field

(Left side of PV field)

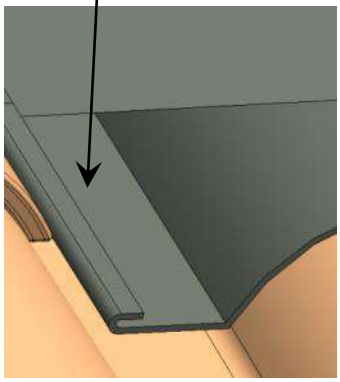


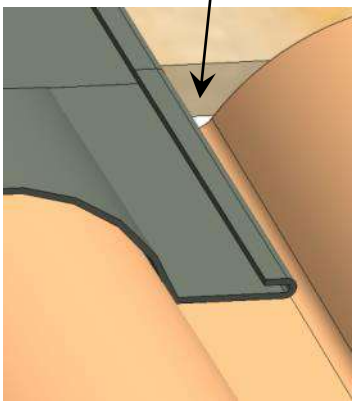


(Right side of PV field)



Make a flip over from 10 to 15 mm on the right and left side of the bottom flashing on all the height



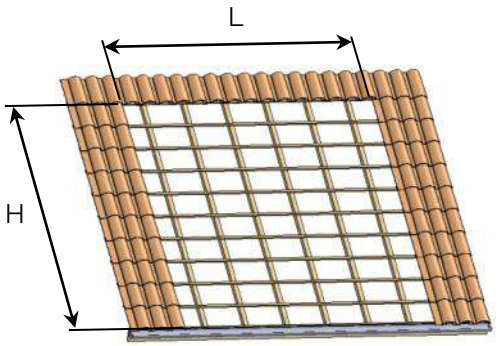


* Reference nomenclature

PV field positioned at the gutter/eave

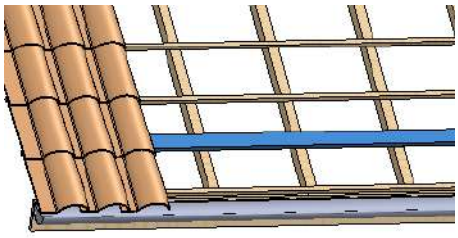
12.2.1) PV field positioned at the gutter/eave

This section of the assembly guide relates only to the installations of PV field positioned at the gutter/eave

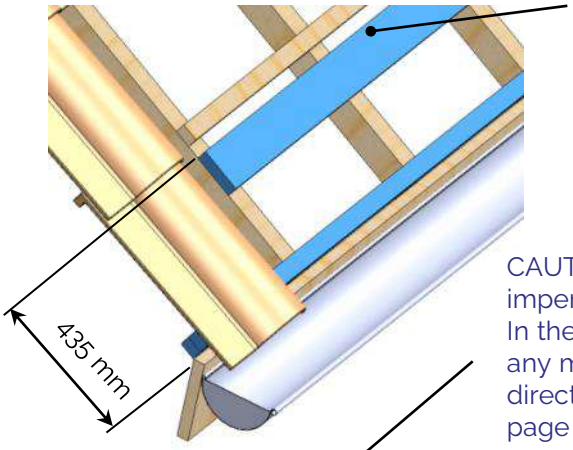


Remove the tiles of the photovoltaic field, for L and H to see page 12 and 13

12.2.2) Positioning of the flooring at the gutter/eave

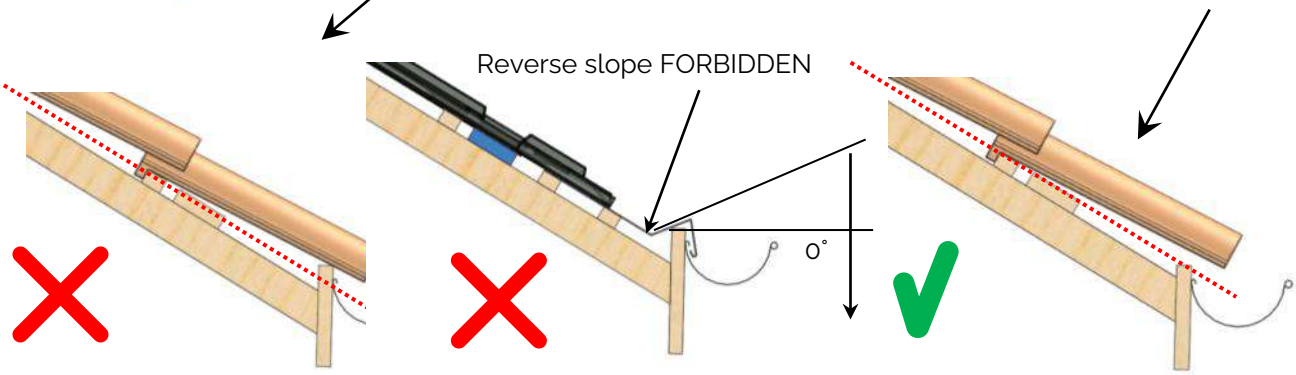


Set up the first support batten at 435 mm from the first batten or the eave batten (tilting lath).
Screw the support batten following the recommendations page 17 to 20 to know the type and the number of screws to be used.
.



Reference support batten (d)* * Reference nomenclature

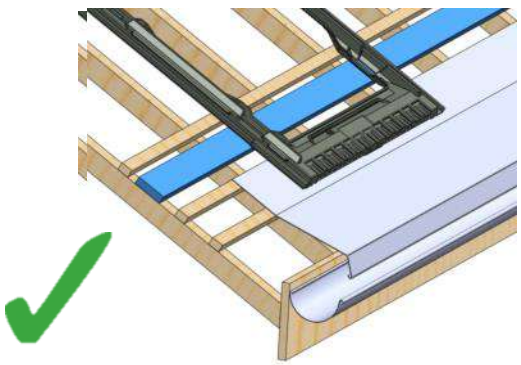
CAUTION: The low part of PV field (with the gutter) must imperatively be on the same plan as the flooring of the system. In the contrary case the dimension of 435 mm is not applicable any more. It is necessary to go move up the PV field in the rake direction. The dimension of positioning must be redefined, see page 29.

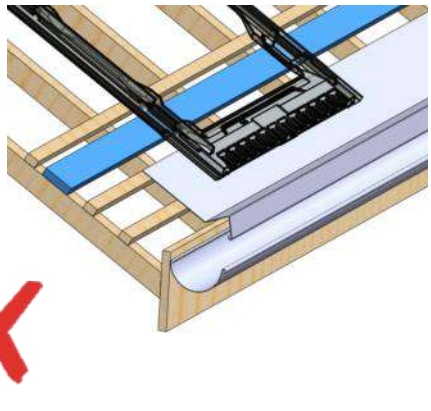


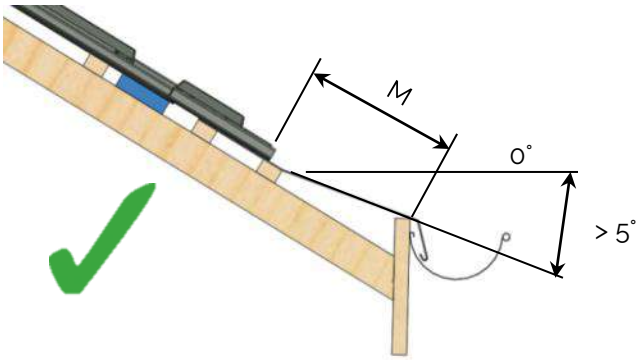
PV field positioned at the gutter/eave

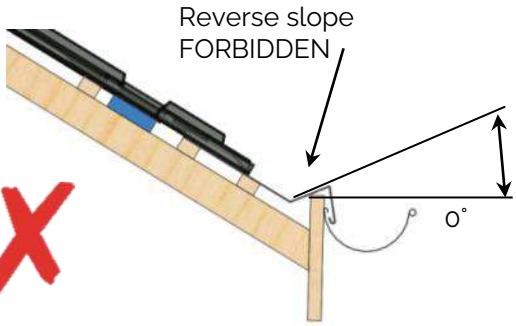
12.2.3) Support batten position for installation at the gutter

The bottom part (at the gutter) of the PV field must be at the same level than the rest of the PV field. If this is not the case the 435mm position is not any more applicable, it's necessary the raise the PV field further up.

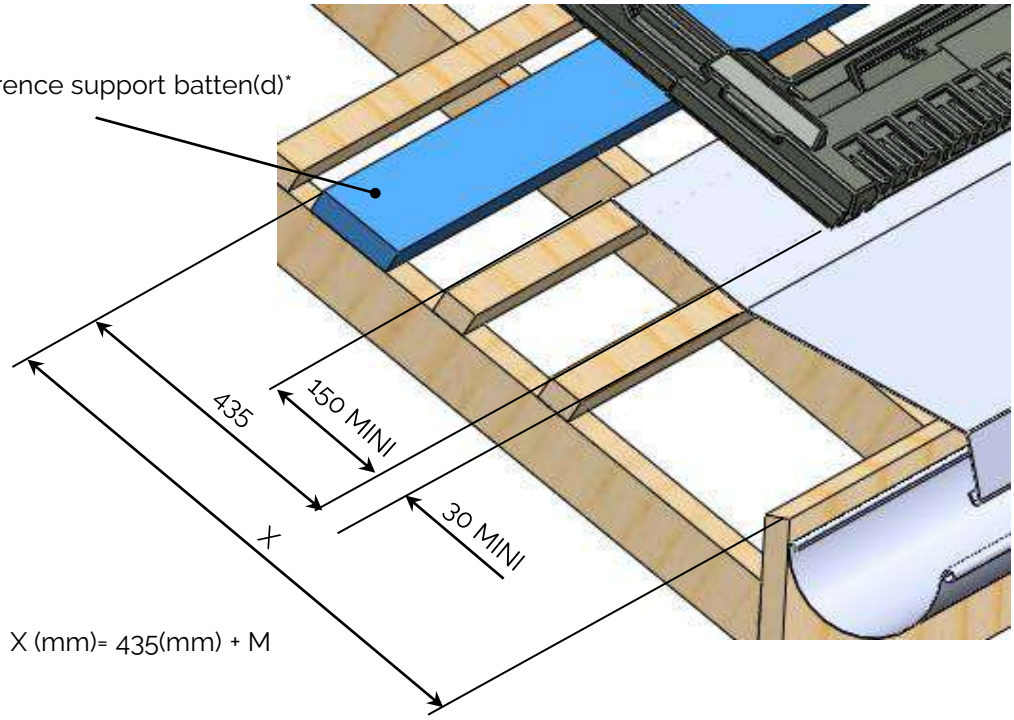








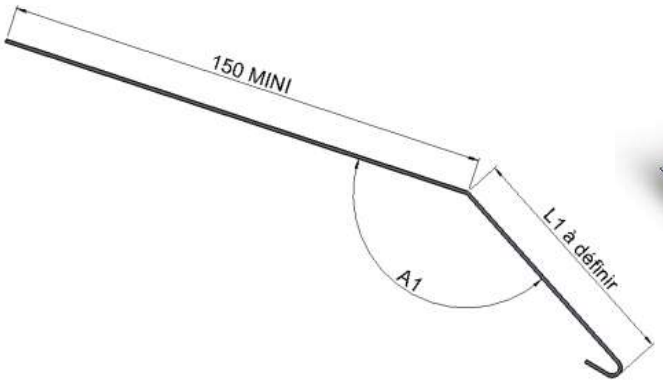
"M" to be measured on the roof by observing the conditions described here

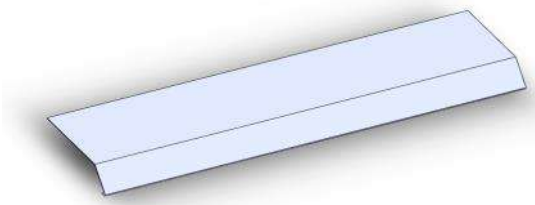


* Reference synopsis

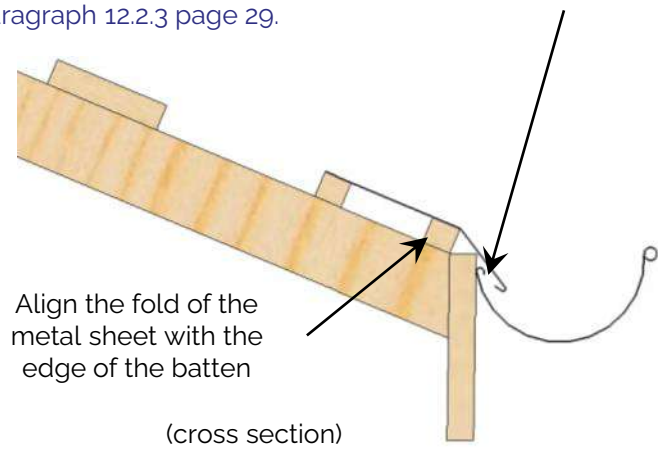
PV field positioned at the gutter/eave

12.2.4) Installation of the bottom metal sheet

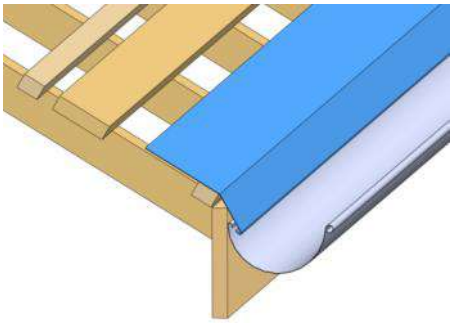




To realize the bottom metal sheet, the A1 angle is equal to 115°+ the angle of inclination of the roof.
Example: A1 = 115° +30° = 145°
the L1 dimension is defined by the position of the gutter. Define L1 so that the low end of the metal sheet is at least 20 mm in the sewer.
NOTE: this kind of metal sheet is applicable only for the PV field positioned at the gutter/eave. See paragraph 12.2.3 page 29.

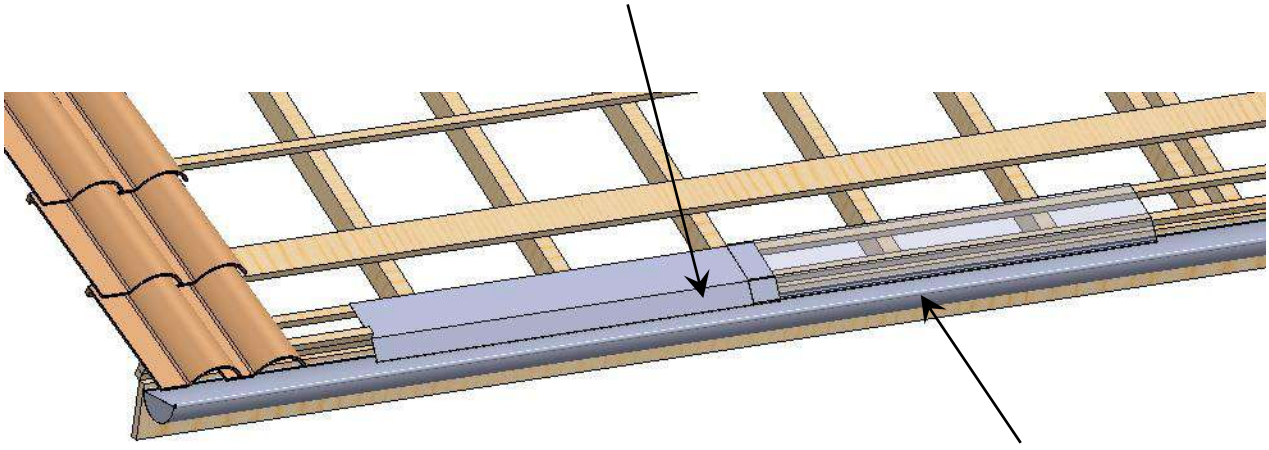


(cross section)



(cross section)

The length of the metal sheet can be variable. If it is needed to use several metal sheets, those will have imperatively to overlap of 100 mm MINI.



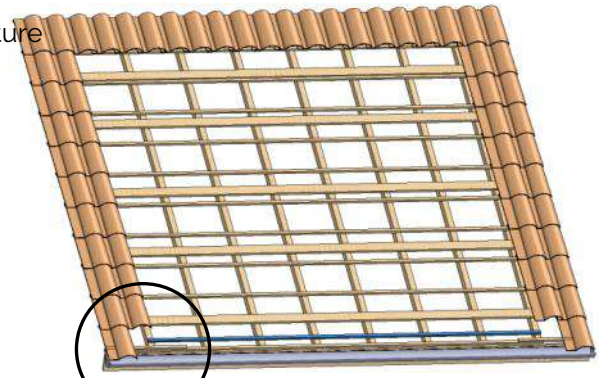
Metal sheet in transparency

PV field positioned at the gutter/eave

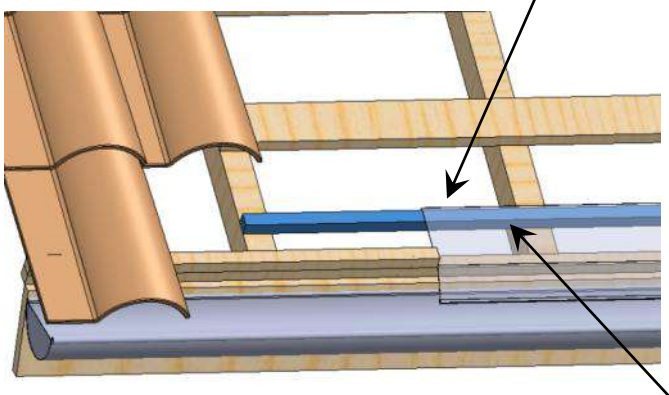
12.2.4) Installation of the bottom metal sheet

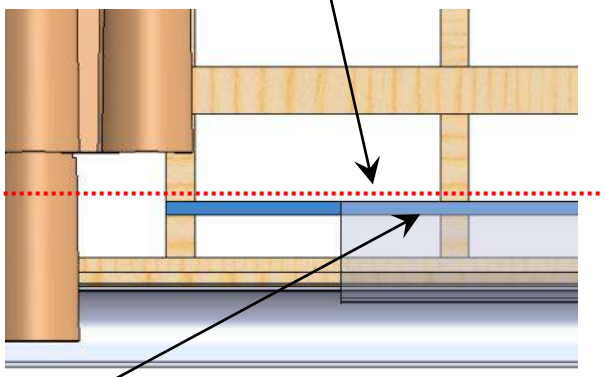
Add a batten or a support batten under the bottom metal sheet to support this one. This batten will at least make all the width of the PV field. The thickness of this batten will be identical to the thickness of the support batten (d)*.

* Reference nomenclature



Align the batten with the higher edge of the bottom metal sheet

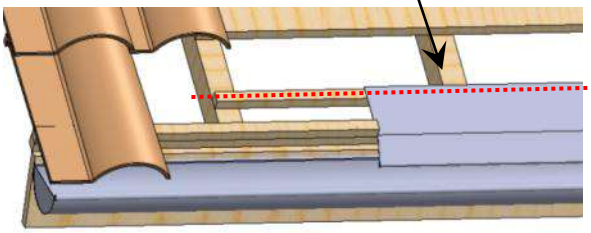


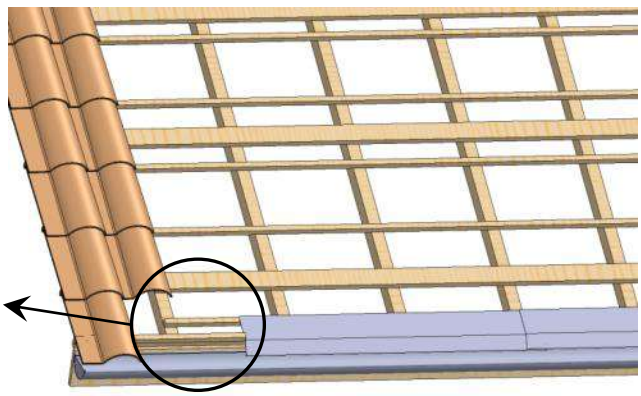


(View of top)

Bottom metal sheet in transparency

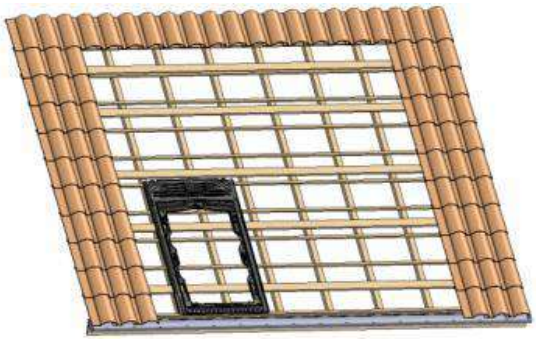
Set up and fasten the bottom metal sheet all over the width of the PV field. Fasten only the top part of the bottom metal sheet.



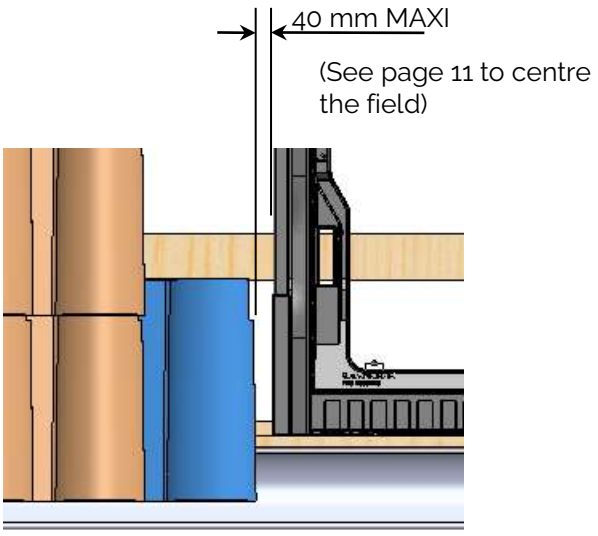


PV field positioned at the gutter/eave

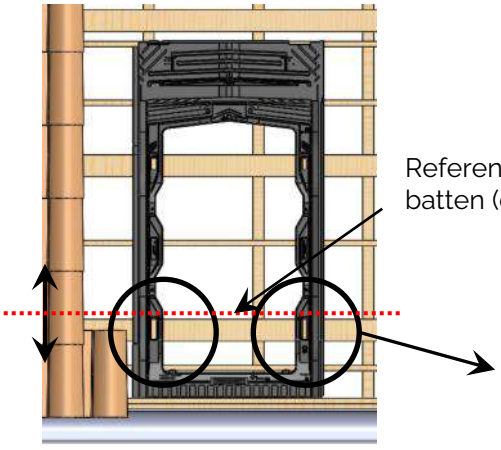
12.2.4) Installation of the bottom metal sheet



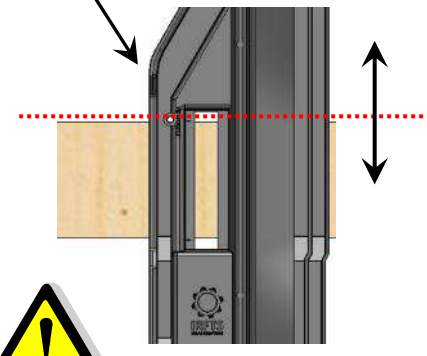
Replace the first tile at the lower left corner, Position the first frame (1) at a distance of 40 mm MAXIMUM of the edge of the tile.



Situation A - Assembly on a roof without counter battening

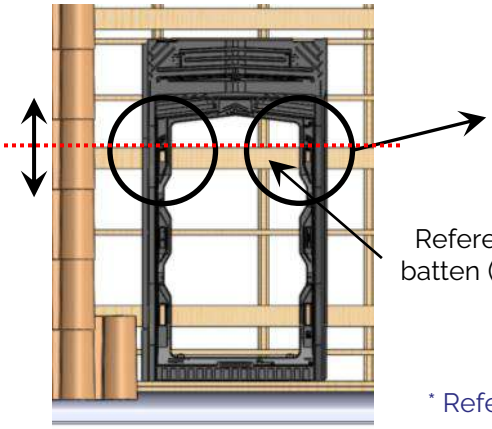


Position the frame (1) in the rake direction using two screws of Ø 5 placed in the openings indicated and put them leaning against the reference support batten (d)



DO NOT SCREW THESE SCREWS IN REFERENCE SUPPORT BATTEN.
MUST REMOVE SCREWS BEFORE THE MOUNTING OF THE PV MODULES.

Situation B - Assembly on a roof with counter battening

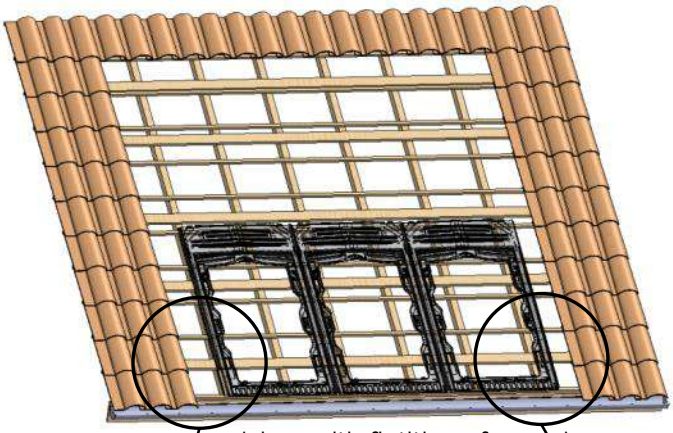


* Reference nomenclature

PV field positioned at the gutter/eave

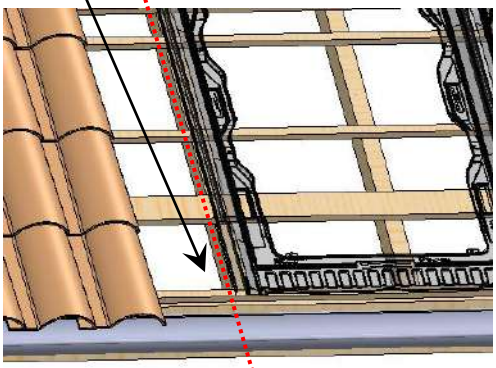
12.2.4) Installation of the bottom metal sheet

The bottom metal sheet must be aligned with the frames on each side of the PV field.
Position all the frames of the first line while proceeding as indicated page 28. Do a marking at each end on the wood. Then slide the frames upward slightly.



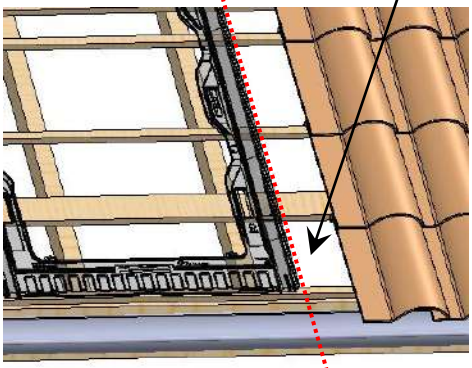
(view with fictitious frames)

Marking



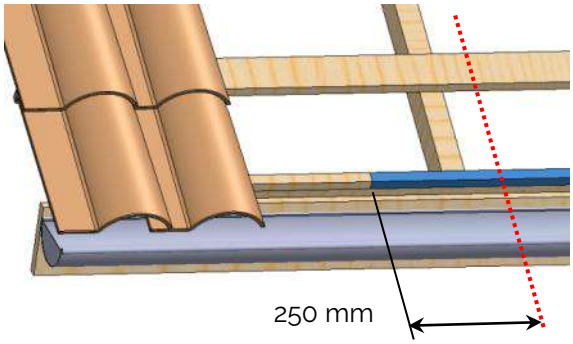
(view with fictitious frames)

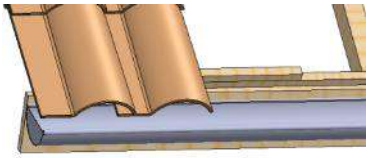
Marking

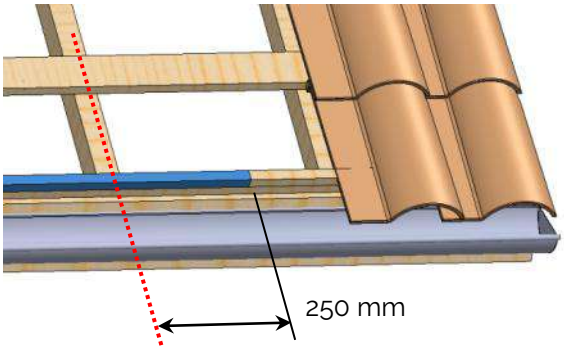


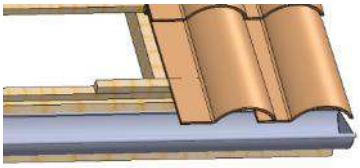
(view with fictitious frames)

Cut the top batten of the double lath 250mm wider than the marking so that the remaining batten is on the same level as the reference support batten. If the barge board is too high, cut it again along all the length of the batten that was removed previously.







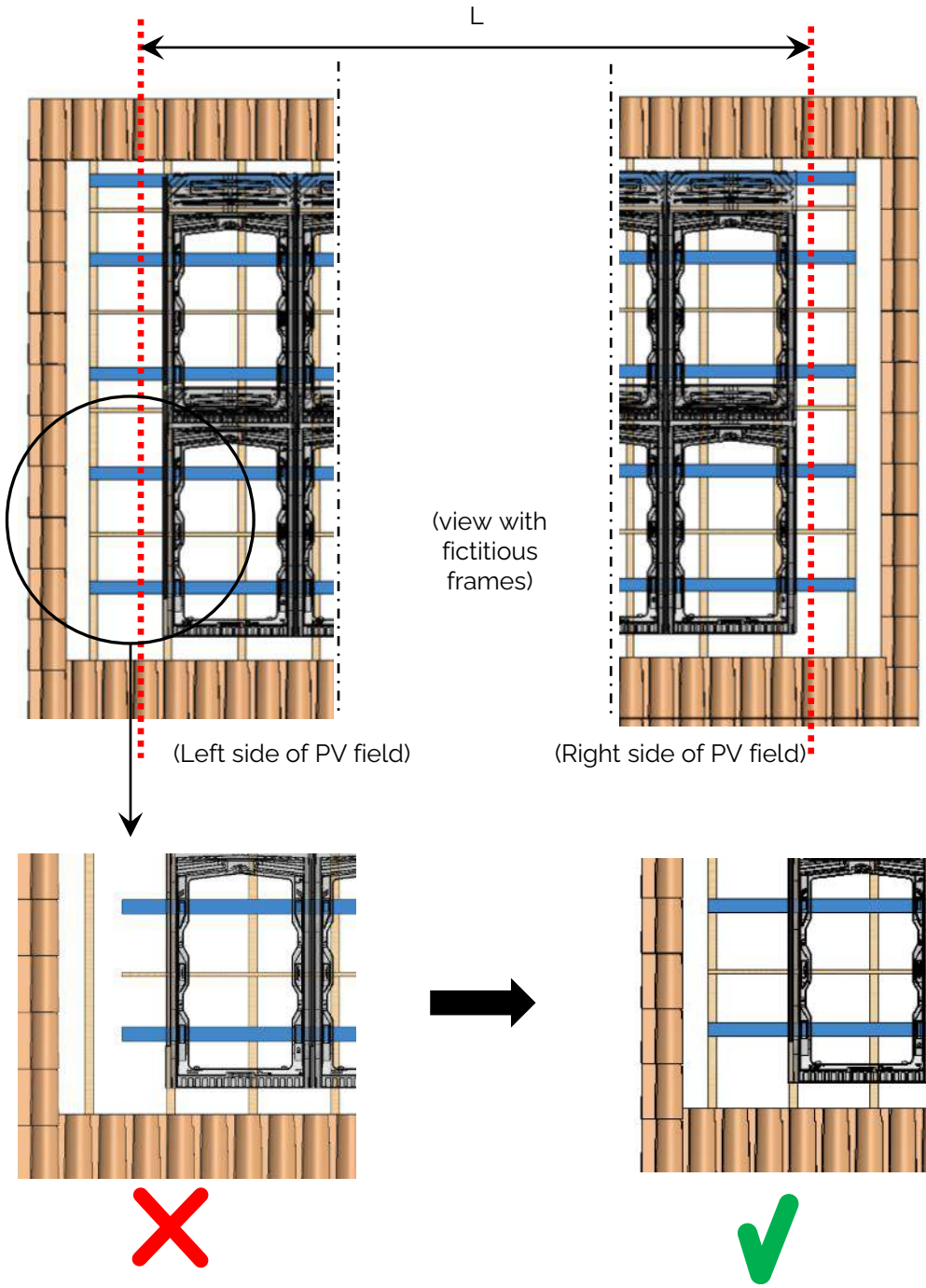


Flooring Installation

12.3) Flooring installation for all PV field installation

The length "L" of the support battens (d)* must imperatively make all the width of the PV field.
For the value "L" to see table page 17 of this document.
If needed, add to this dimension "L" a sufficient length on each side of PV field so that the ends of the batten lean on the rafter on both sides.

* Reference nomenclature



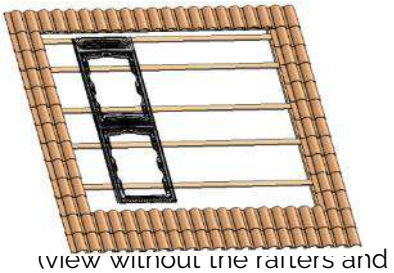
Flooring installation

12.3) Flooring installation for all PV field installation

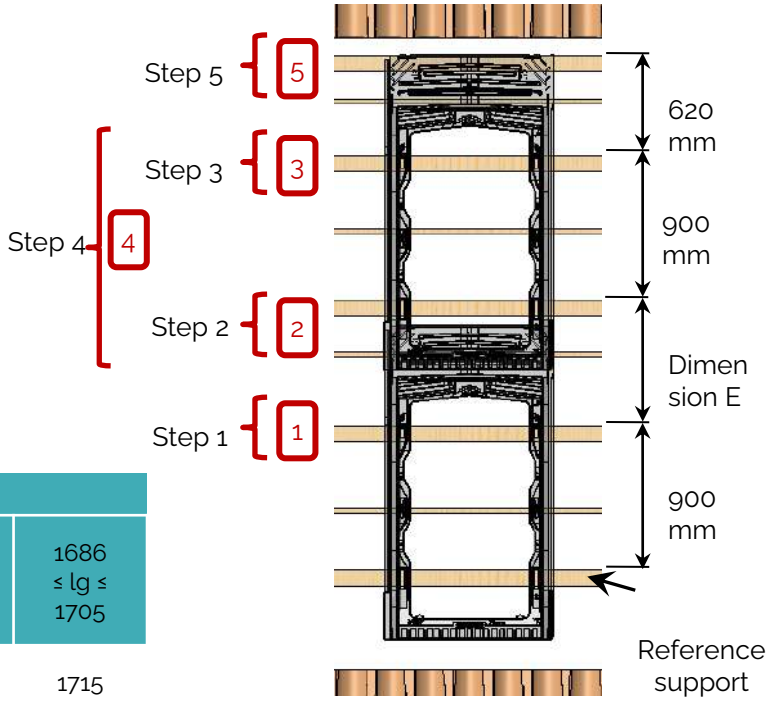
12.3.1) Flooring for an assembly with 4 fixings per module

Set up the horizontal flooring for the frames support with a number of support batten (d)* equal to (2 X no. vertical PV modules) + 1 at the top.
To screw the support batten follow the recommendations page 21 to 24 to know the type and the number of screws to be set up. If the roof undergoing work is battened, remove the battens that are located where the support battens are to be installed.

Step 1: Position and screw the first support batten 900 mm above the reference support batten (installed at the preceding Step).
Step 2: To position and screw another support batten at the coast E of the preceding one, for the value of E, see the table below.
Step 3: Position and screw another support batten 900 mm above the preceding one.
Step 4: Repeat Steps 2 and 3 as many times as necessary up to the highest line of modules.
Step 5: Position and screw the last support batten 620 mm above the preceding one.



(view without the rafters and tiles batten)



(view without the rafters and batten tiles batten)

Without deflector and locking bar				
Module length(lg)	≤ 1645	1646 ≤ lg ≤ 1665	1666 ≤ lg ≤ 1680	1686 ≤ lg ≤ 1705
System vertical step	1655	1675	1695	1715
Dimension E	755	775	795	815

	Module length(lg)						
	≤ 1635	1636 ≤ lg ≤ 1645	1646 ≤ lg ≤ 1655	1656 ≤ lg ≤ 1665	1666 ≤ lg ≤ 1680	1681 ≤ lg ≤ 1685	1686 ≤ lg ≤ 1705
System vertical step	1655	1665	1675	1685	1695	1705	1715
Dimension E	755	765	775	785	795	805	815
ATTENTION: check module's compatibility ANNEX 6 page 72 on WWW.IRFTS.COM							

Flooring installation

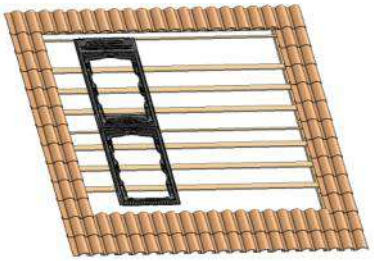
12.3) Flooring installation for all PV field installation

12.3.2) Flooring for an assembly with 6 fixings per module

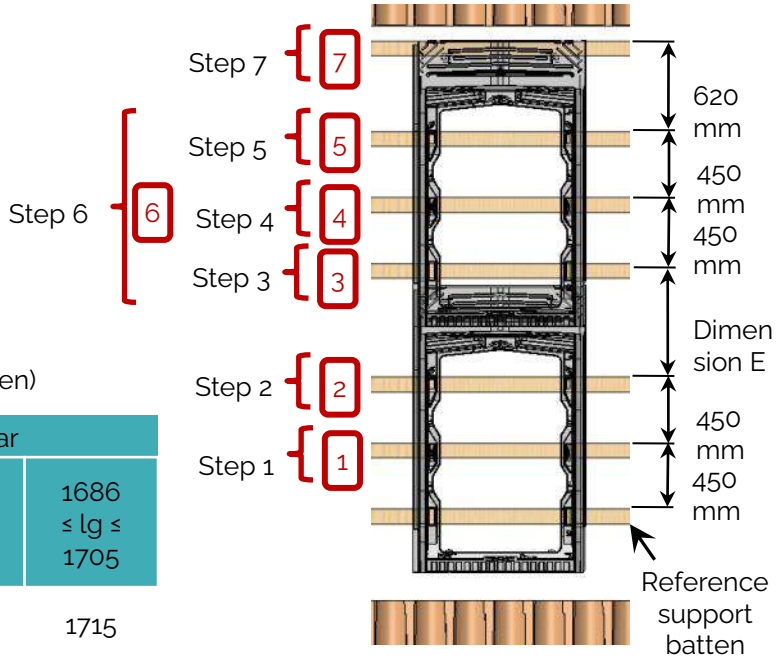
Set up the horizontal flooring for the frames support with a number of support batten (d)* equal to (3 X no. vertical PV modules) + 1 at the top.
To screw the support batten follow the recommendations page 21 to 24 to know the type and the number of screws to be set up. If the roof undergoing work is battened, remove the battens that are located where the support battens are to be installed.

Step 1: Position and screw the first support batten 450 mm above the reference support batten (installed at the preceding Step).
Step 2: Position and screw another support batten 450 mm above the preceding one.
Step 3: Position and screw another support batten at the dimension E of the preceding one, for the value of E, see the table below.
Step 4: Position and screw another support batten 450 mm above the preceding one.
Step 5: Position and screw another support batten 450 mm above the preceding one.
Step 6: Repeat Steps 3.4 and 5 as many times as necessary up to the highest line of modules.
Step 7: Position and screw the last support batten 620 mm above the preceding one.

* Reference nomenclature



(view without the rafters and tiles batten)



(view without the rafters and tiles batten)

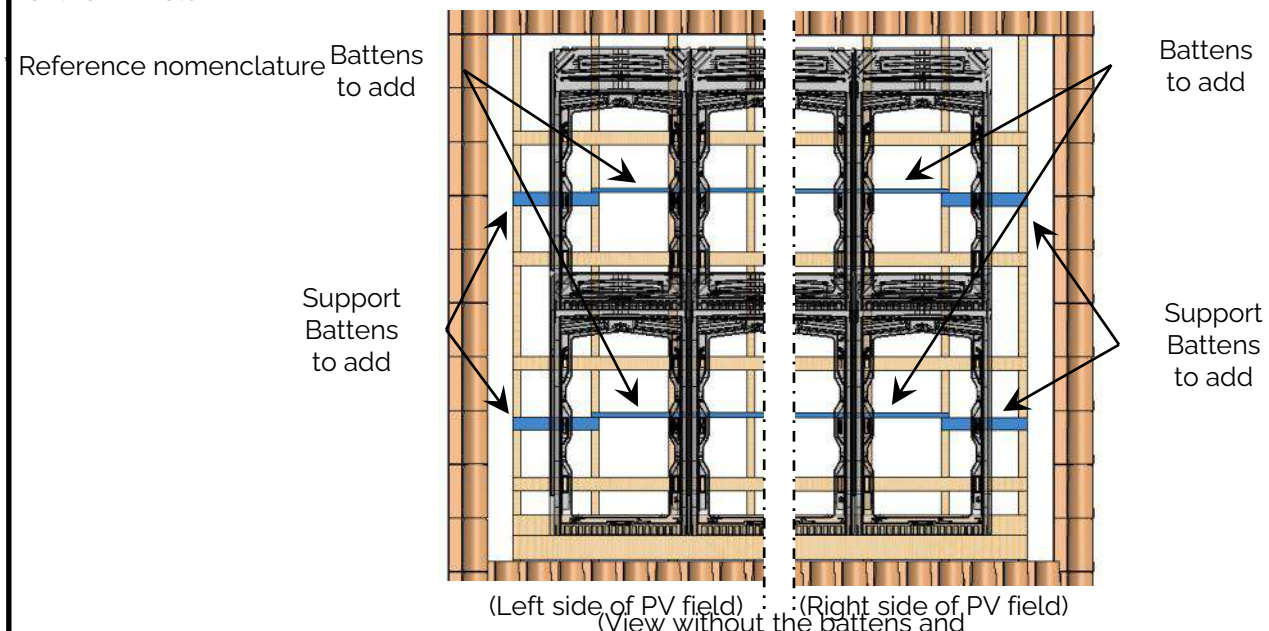
Without deflector and locking bar				
Module length(lg)	≤ 1645	1646 ≤ lg ≤ 1665	1666 ≤ lg ≤ 1680	1686 ≤ lg ≤ 1705
System vertical step	1655	1675	1695	1715
Dimension E	755	775	795	815

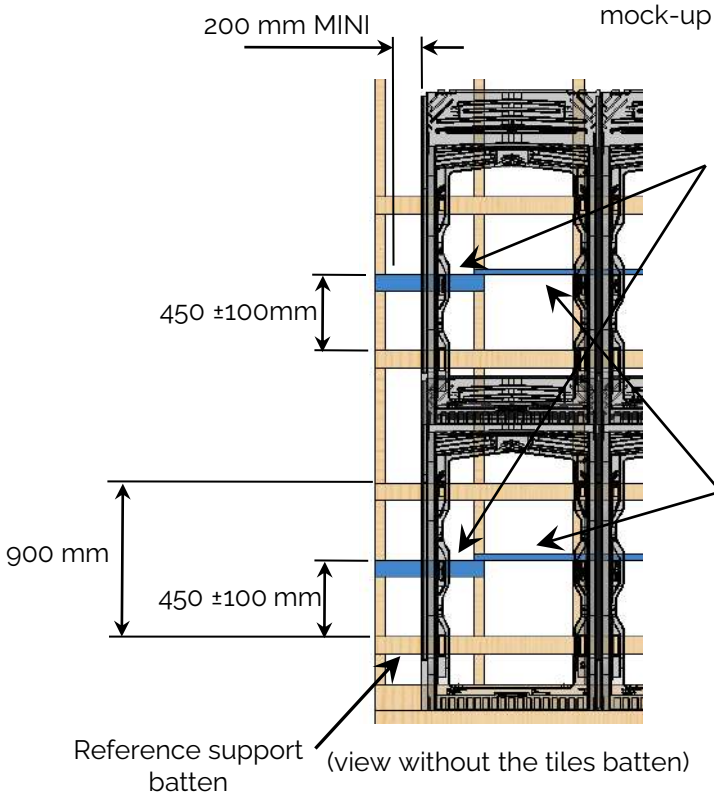
With deflector and locking bar						
Module length(lg)						
≤ 1635	1636 ≤ lg ≤ 1645	1646 ≤ lg ≤ 1655	1656 ≤ lg ≤ 1665	1666 ≤ lg ≤ 1680	1681 ≤ lg ≤ 1685	1686 ≤ lg ≤ 1705
System vertical step	1655	1665	1675	1685	1695	1705	1715
Dimension E	755	765	775	785	795	805	815
ATTENTION: check module's compatibility ANNEX 6 page 72 on WWW.IRFTS.COM						

Flooring installation

12.3.2) Flooring for an assembly with 4 fixings per module

On an assembly with 4 fixings per module, it is necessary to add and fix battens on each side of the PV field, with a thickness and width identical to the support batten (d)*. These battens will be used for the fixing of side flashings.
The battens must pass under the frame, to exceed this one of at least 200 mm MINI outside the PV field.
For a roof without tiles battens, it is imperatively necessary to add a horizontal batten with a thickness identical to the support batten (d)* by line of frame, centered on the height of each line, over all the width of the PV field.





1°) Position and screw a support batten at 450 mm ±100 from the preceding one in each interval of 900 mm

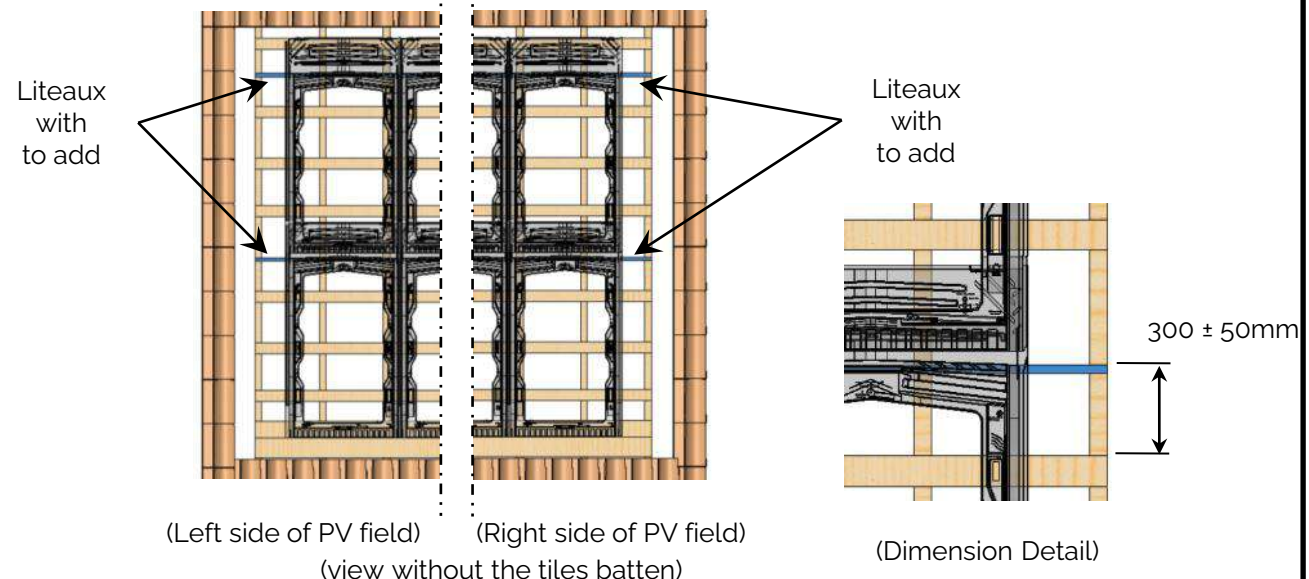
2°) If necessary according to the recommendations, position and screw the battens all over the width of the PV field leaning against the battens previously posed.

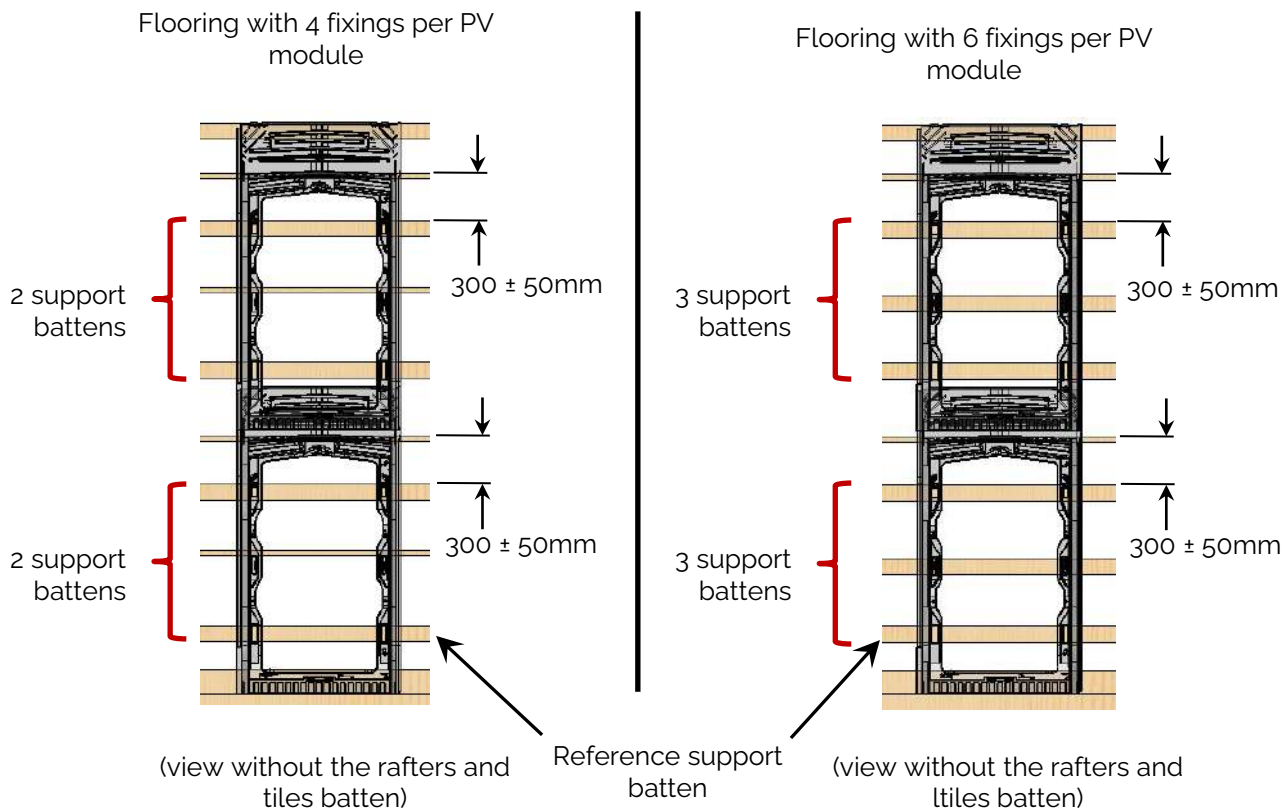
Flooring installation

12.3.3) Installation of leaning batten

To ensure a good support where the frames overlap it is necessary to set up and to fix a horizontal batten every three support battens (d)* for the assemblies with 6 fixings, every 2 support battens (d)* for the assembly with 4 fixings.
If no tiles battens exists in the zones described below, add battens all over the width of the PV field.
Those battens will have the same thickness as the support batten(d)*. Position at 300 ± 50 mm of the lower support batten.
It is imperative to make this operation for all the lines of frame of the PV field.

* Reference nomenclature





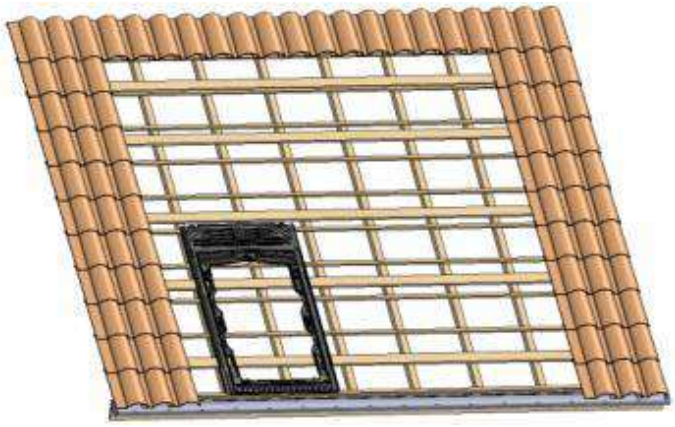
12.4) Installation of system EASY-ROOF

This section of the installation manual relates to all kind of installation (middle of the rake or at the gutter)

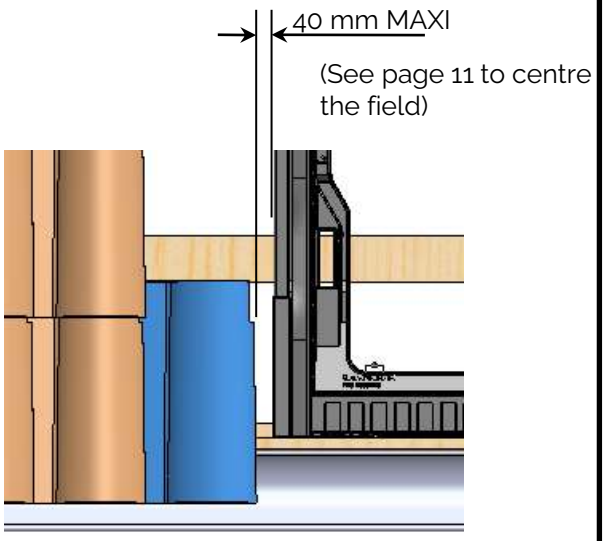
12.4.1) Installation of underlay film

We require the installation of a breather membrane before the EASY ROOF integration system is put in place. Add the breather membrane if it does not already exist.
The installation of the membrane is described in a document entitled "INSTRUCTIONS AND INSTALLATION OF THE BREATHER MEMBRANE" which is available from the manufacturer of the EASY ROOF system. Refer to this document to ensure that the installation is compliant.

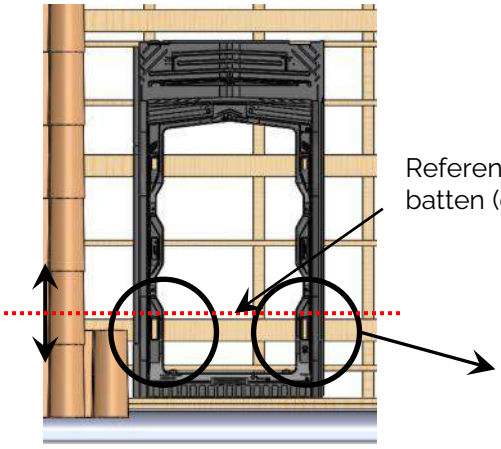
12.4.2) Installation of the bottom metal sheet



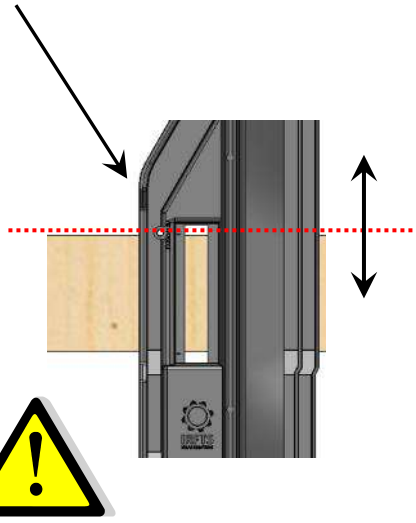
Replace the first tile at the lower left corner, Position the first frame (1) at a distance of 40 mm MAXIMUM of the edge of the tile.



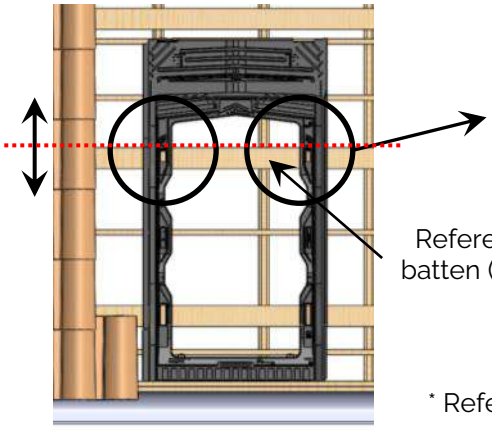
Situation A - Assembly on a roof without counter battening



Position the frame (1) in the rake direction using two screws of Ø 5 placed in the openings indicated and put them leaning against the reference support batten (d)



Situation B - Assembly on a roof with counter battening

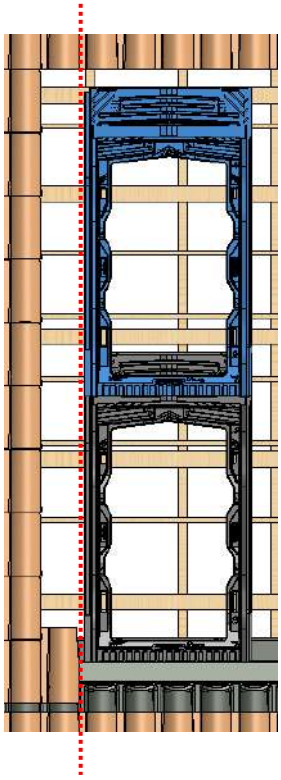


DO NOT SCREW THESE SCREWS IN REFERENCE SUPPORT BATTEN.
MUST REMOVE SCREWS BEFORE THE MOUNTING OF THE PV MODULES.

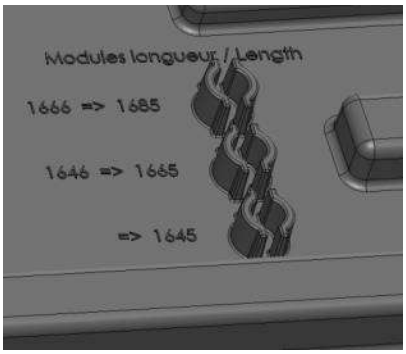
* Reference nomenclature

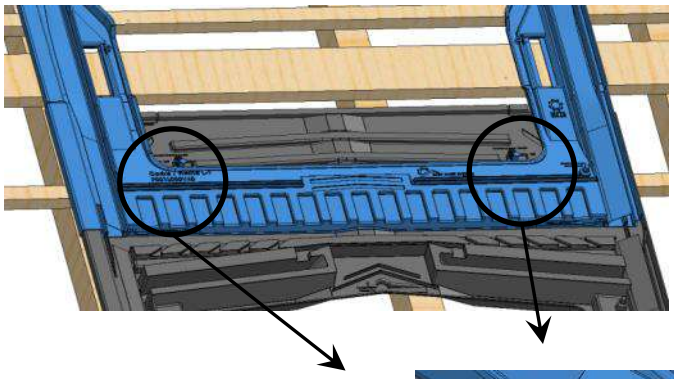
12.4.2) Installation of the EASY-ROOF system

1°) Set up and interlock another frame above the precedent. Align them perfectly in the vertical direction. (do a marking with the chalk line)

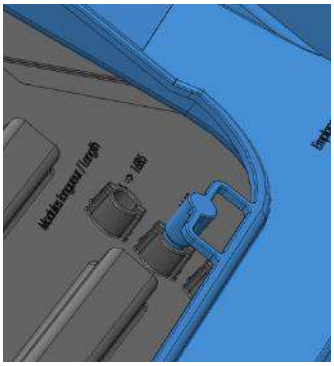


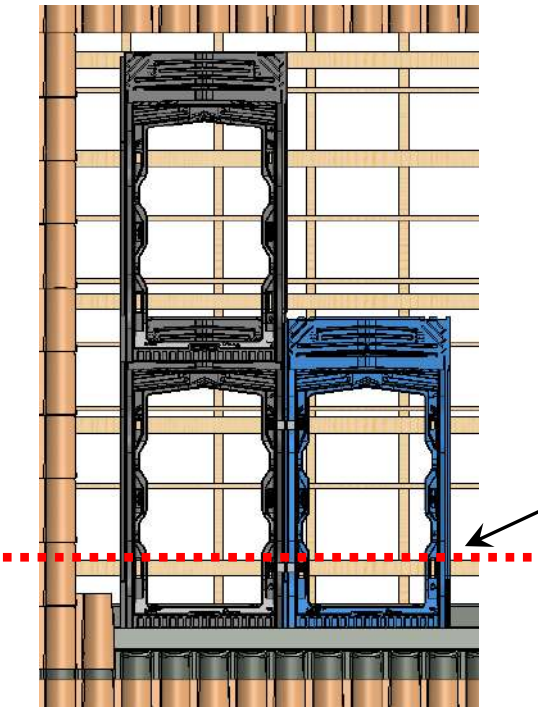
2°) Adjust the vertical step between the frames according to the length of the PV modules. Use one of the three preset indexings on each side of the frame.





3°) Set up another frame on the first line. Align this one on the reference support batten as indicated page 37.

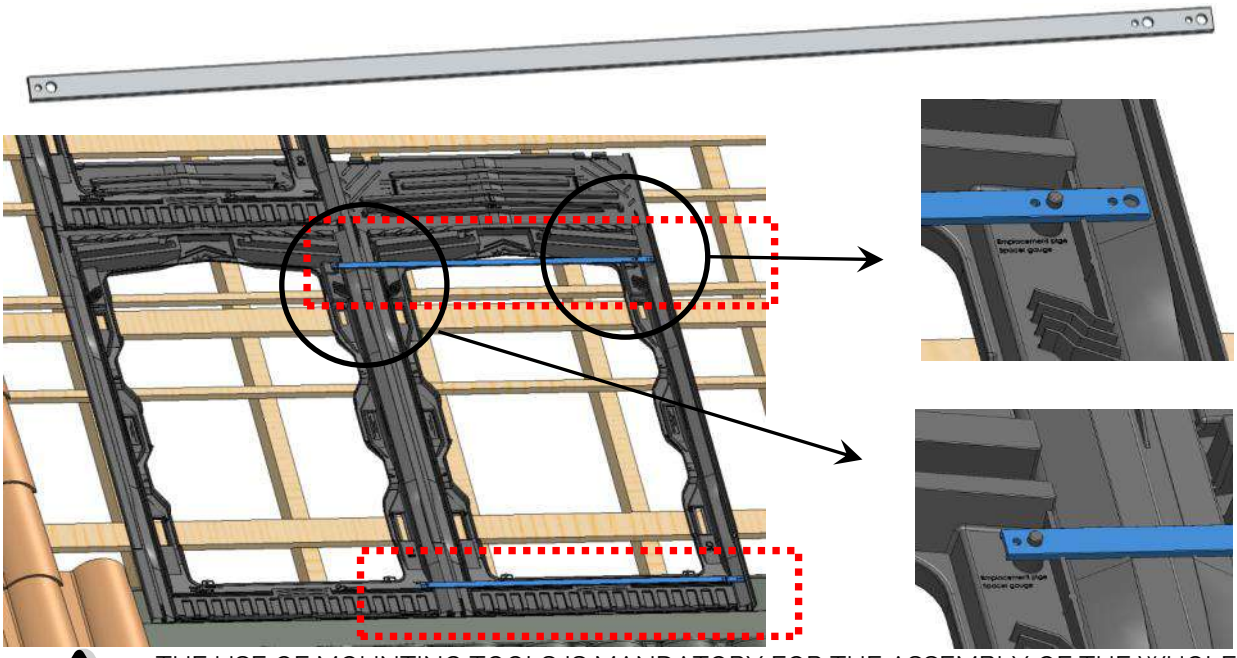




* Reference nomenclature

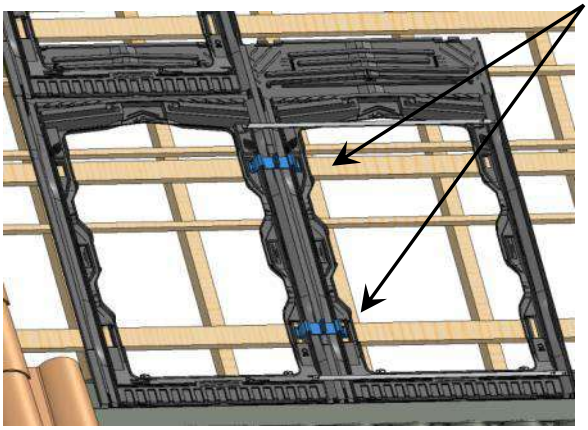
12.4.2) Installation of the EASY-ROOF system

1°) Place two mounting tool (13) on the two bottom frames as shown on the drawing. Two sets of mounting tools (13) at least will be necessary to mount the system.

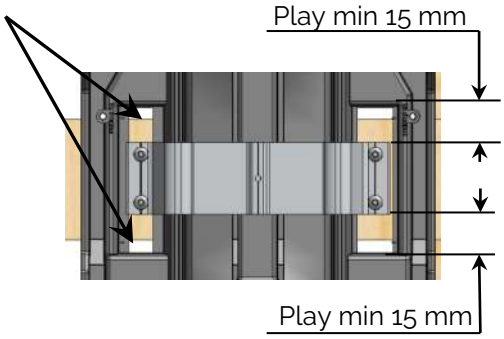


THE USE OF MOUNTING TOOLS IS MANDATORY FOR THE ASSEMBLY OF THE WHOLE SYSTEM.
FOR ASSEMBLY WITH A GLAZING STOP THE USE OF A THIRDMOUNTING TOOL IS MANDATORYSEE ANNEXE 6 OF THE DOCUMENT PAGE 73 FOR OPRATION “b”.

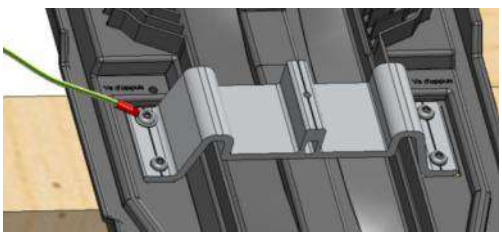
2°) a) Place the superior middle bracket (7) and screw with screws 6x40 STAINLESS (9).
b) Place the inferior middle bracket (7) and screw with screws 6x40 STAINLESS (9).
Do Not put the other fixings immediately. This operation will be carried out later.
DO NOT REMOVE THE MOUNITING TOOL (13) IMMEDIATELY.
NOTE: also mount the central middle clamp (7) for an assembly with 6 fixings.



Center the bracket in the vertical direction in the positioning hole (for dilation)

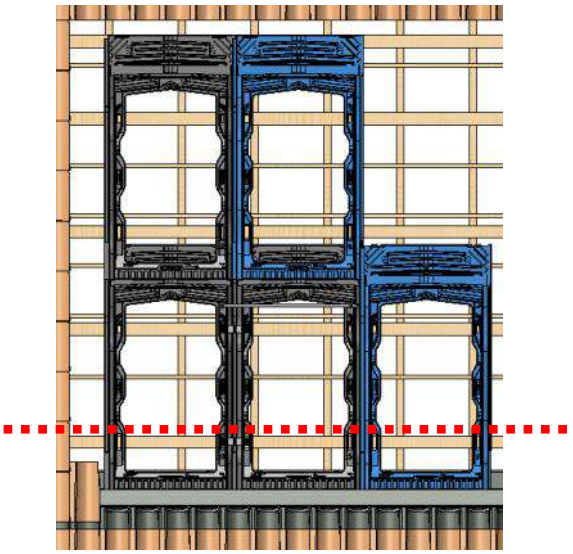


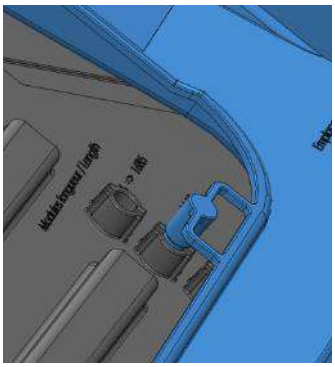
3°) If grounding is not done by connecting the ground wire directly to PV module, carry out this connection by connecting a ground wire on the middle brackets (7). This way it grounds two PV modules. Connect only one mounting bracket by PV module. Carry out this connection each second modules for each line of module.



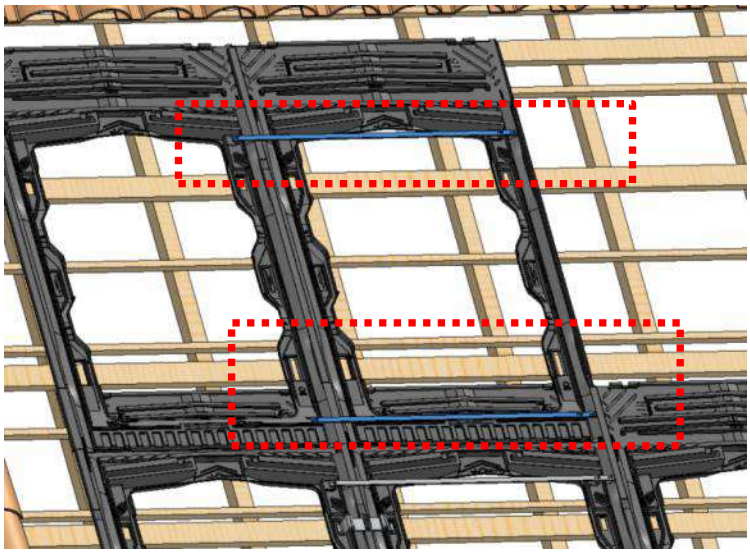
12.4.2) Installation of the EASY-ROOF system

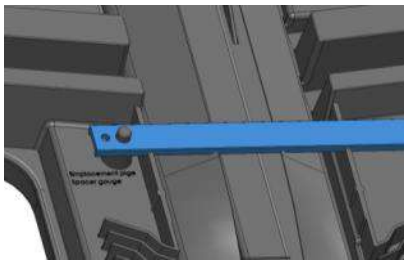
1˚) Set up and interlock another frame on the first line on the right of the precedent. Align this one on the reference support batten as indicated page 40.
2˚) Set up and interlock another frame on the second-row on the right of precedent.
3˚) Adjust the vertical step between the frames using one of the three preset indexings on each side of the frame as done with the precedent frame.

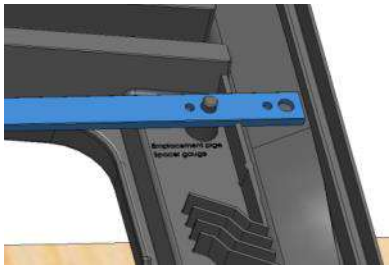




4˚) Place two other mounting tool (13) on the two top frames as shown on the drawing.

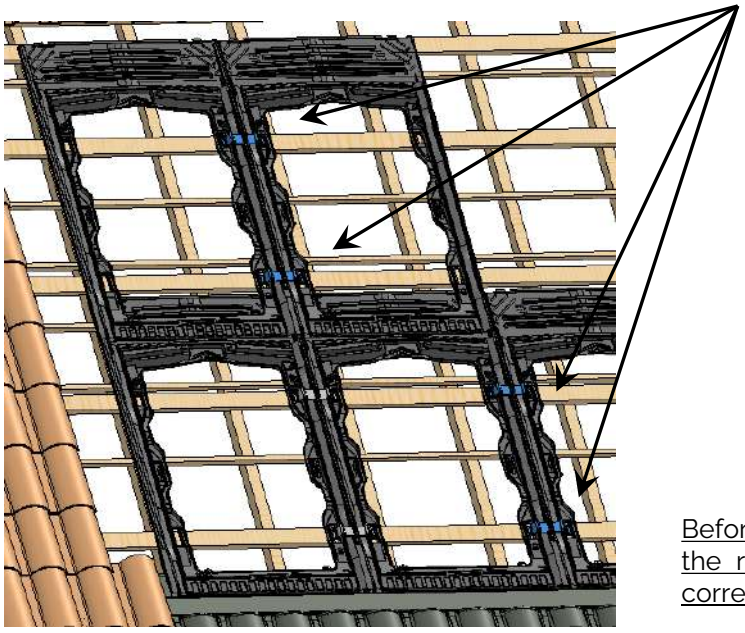


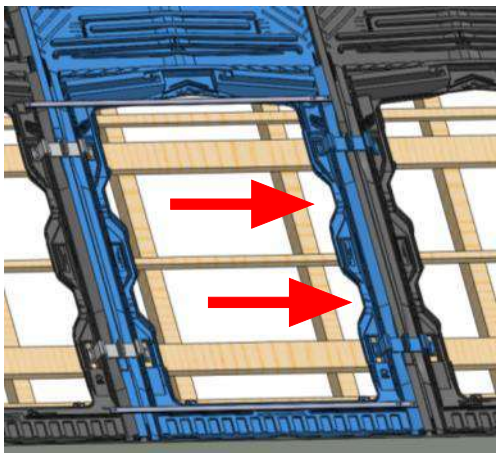




12.4.2) Installation of the EASY-ROOF system

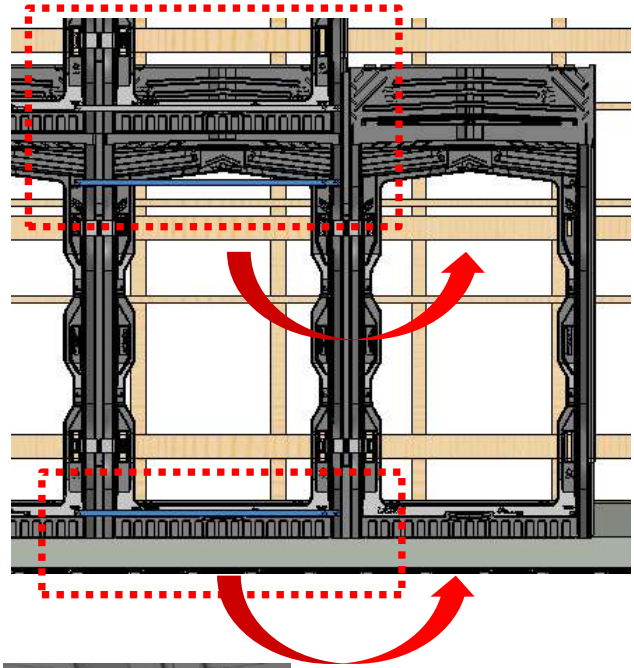
5°) Place the superior and inferior middle bracket (7) and screw with screws 6x40 STAINLESS (9).
Do not put the other fixings immediately. This operation will be carried out later.
Do not forget the grounding.
NOTE: also mount the central middle clamp (7) for an assembly with 6 fixings.

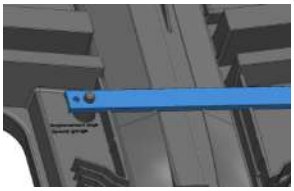




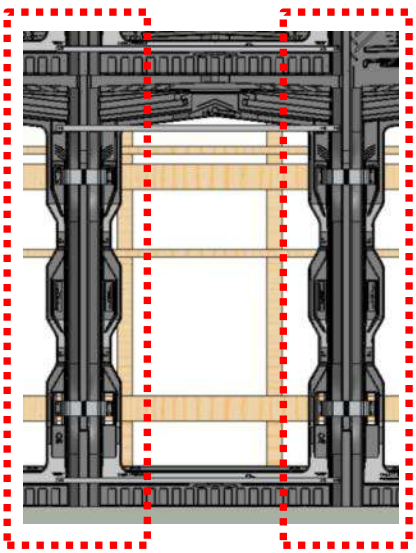
Before to screw the bracket pull the frames to the right to make sure the mounting tool is correctly positionned.

6°) Move the mounting tool (13) from the bottom line to the right.



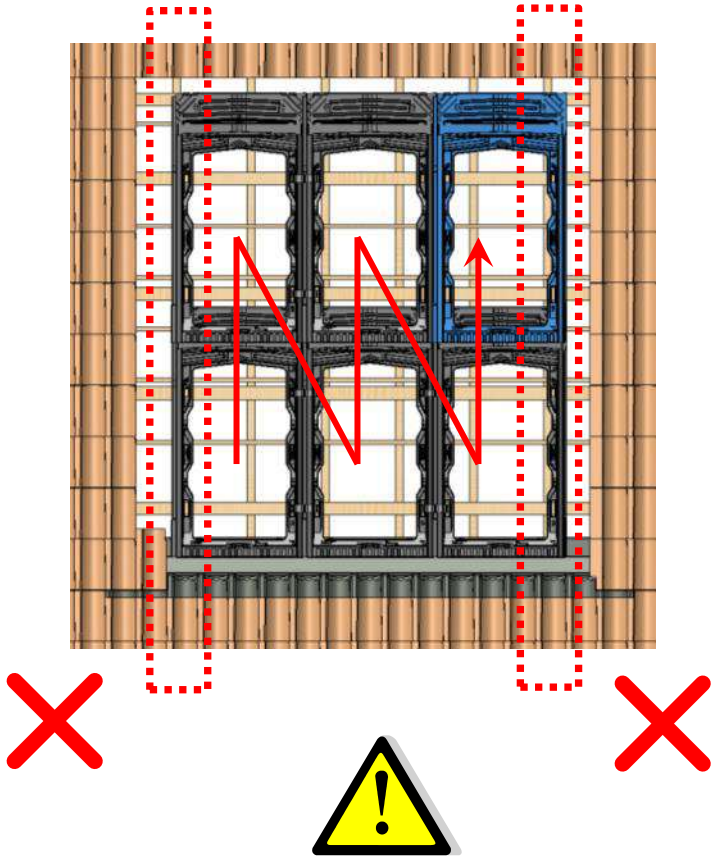


THE MOUNTING TOLL (13) COULD BE MOVED ONLY IF THE 4 (OR 6) MIDDLE BRACKETS ARE MOUNTED.



12.4.2) Installation of the EASY-ROOF system

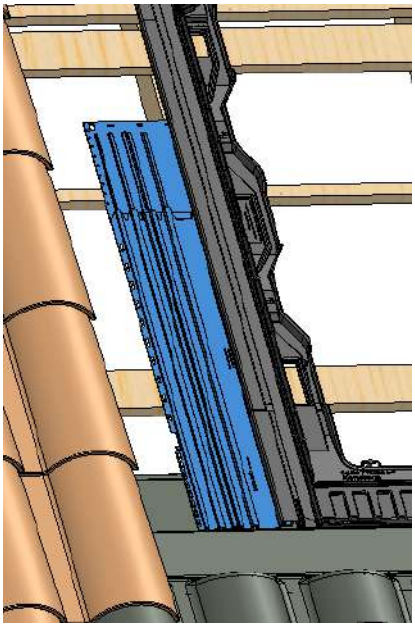
7°) Set up and interlock all the other frames of the PV field by repeating the operations of pages 40 to 43.



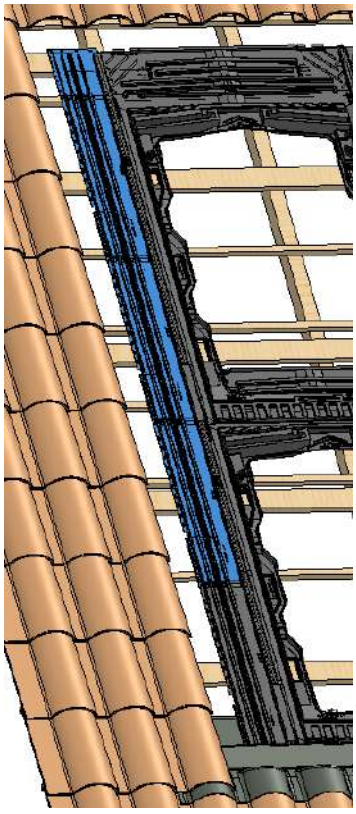
DO NOT PUT IN PLACES THE END BRACKET ON THE SYSTEM, THIS OPERATION WILL BE CARRIED OUT LATER AFTER THE POSE OF THE SIDE FLASHING.

12.4.3) Installation of system EASY-ROOF

1°) Position the first left flashing beside the first frame.

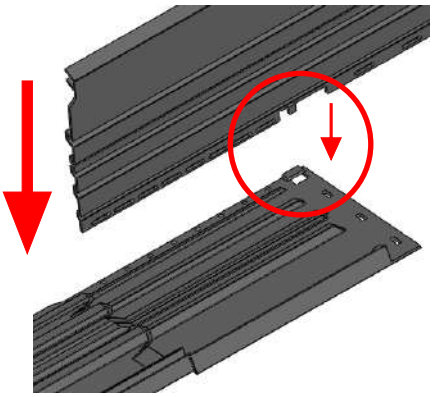


2°) Set up the others one, they interlock each other (See opposite).

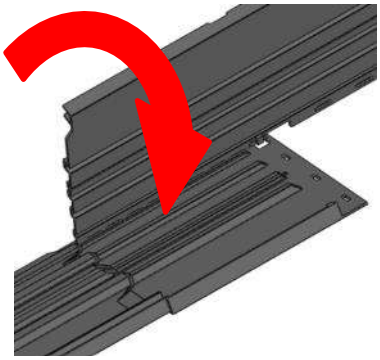


Flashings assembly

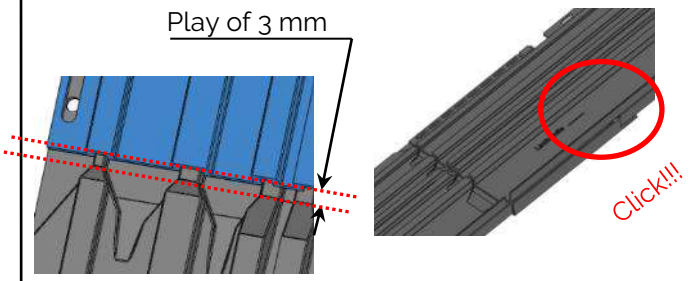
a°) Interlock the pin of the second flashing in the first one.



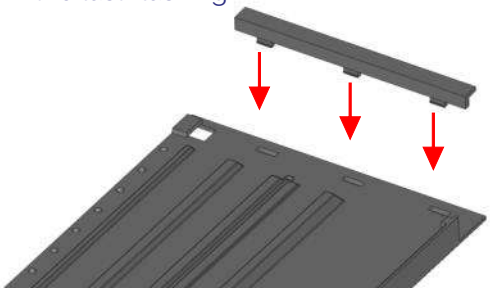
b°) Rotate the second flashing.



c°) Clip the second flashing with the other. Make a space of 3mm between the two.



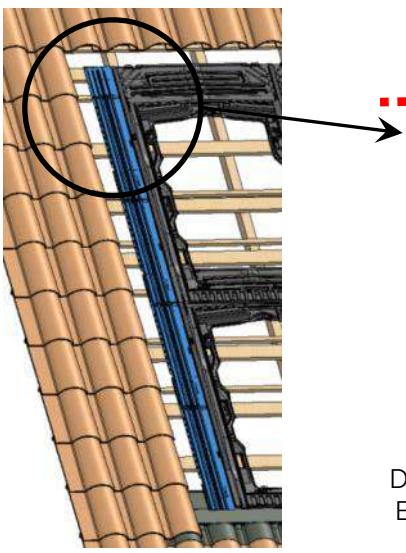
d°) Optional : Clip the frieze support at the top of the last flashing.

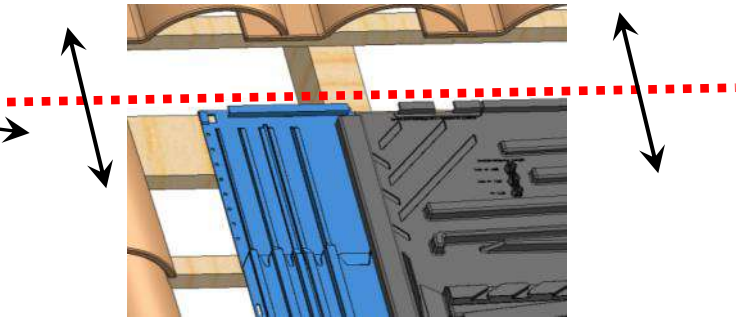


12.4.3) Installation of the EASY-ROOF system

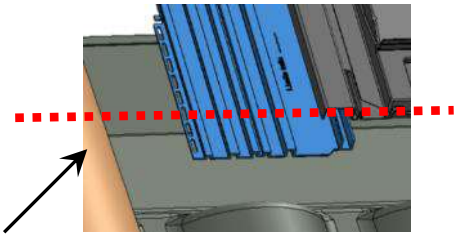
3˚) Slightly lift the frames on the left, to drag the row of flashings under the frames.

4˚) Align the last flashing with the top of the frame.

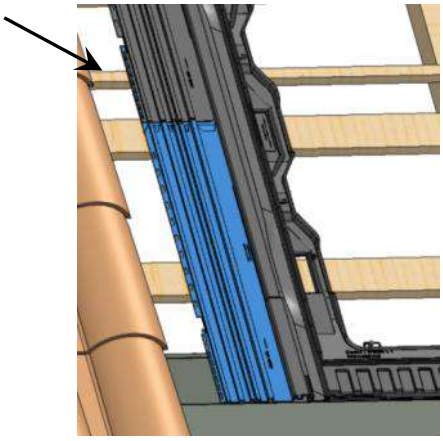


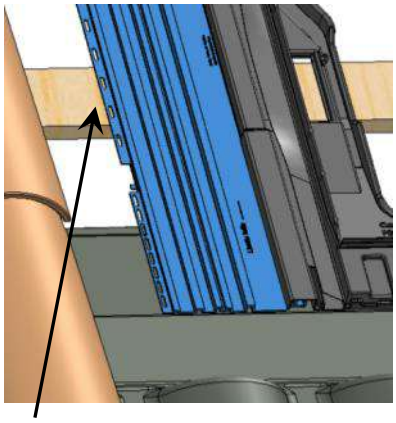


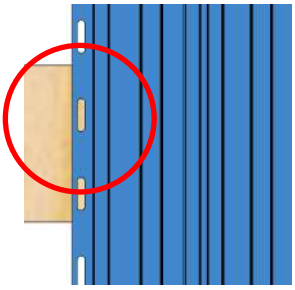
DO NOT TOUCH THE BOTTOM FLASHING



5˚) At the bottom of the field cut the part of flashing which exceeds the frame if necessary.
6˚) Set up a screw convex head 5x30 stainless (b) at each flashing overlap. Screw moderately.

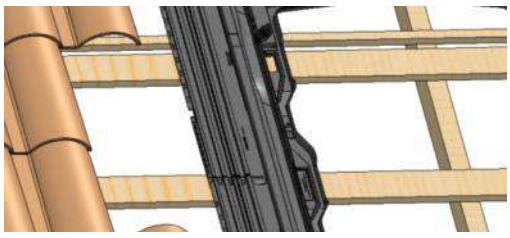






7˚) Set up a screw convex head 5x30 stainless (b) centered on the oblong hole. Screw moderately. VERY IMPORTANT, to unscrew one turn, that is useful for the dilation of the part.

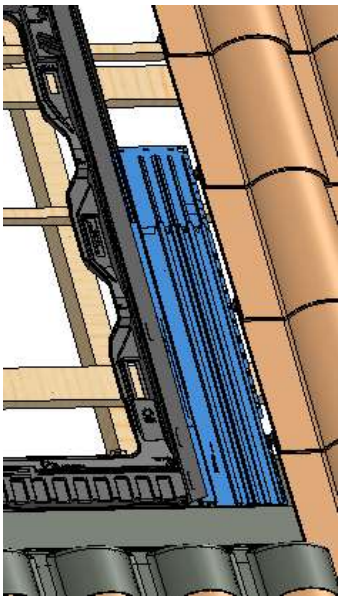
8˚) If there is no batten under the flashings overlap, add a batten under the overlap.



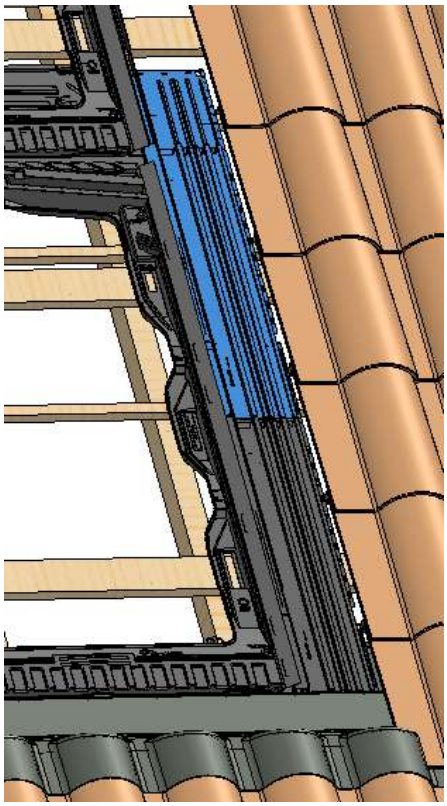
9˚) Fix all left flashings by applying instructions 6.7 and 8.

12.4.4) Installation of the EASY-ROOF system

1°) Position the first right flashing beside the first frame.

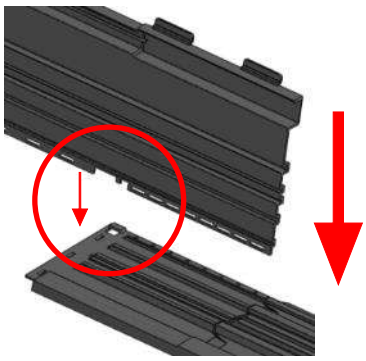


2°) Set up the others one, they interlock each other (See opposite).

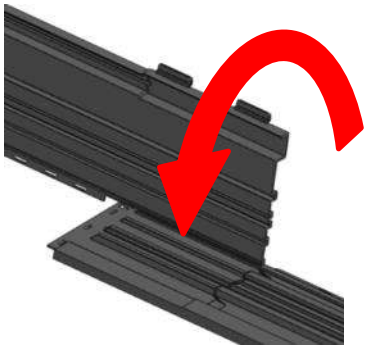


Flashings assembly

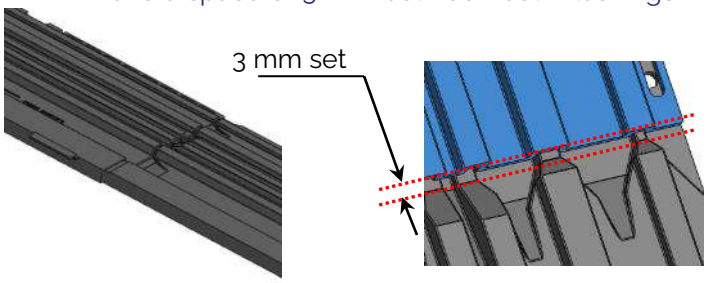
a°) Interlock the pin of the second flashing in the first one.



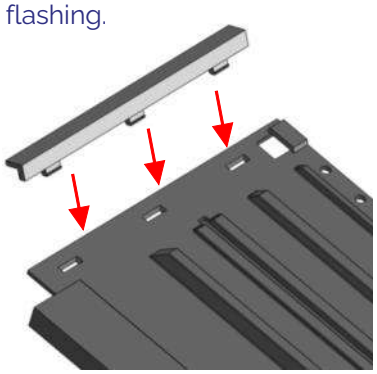
b°) Rotate the second flashing.



c) Slick the second flashing with the other.
Make a space of 3 mm between both flashings.

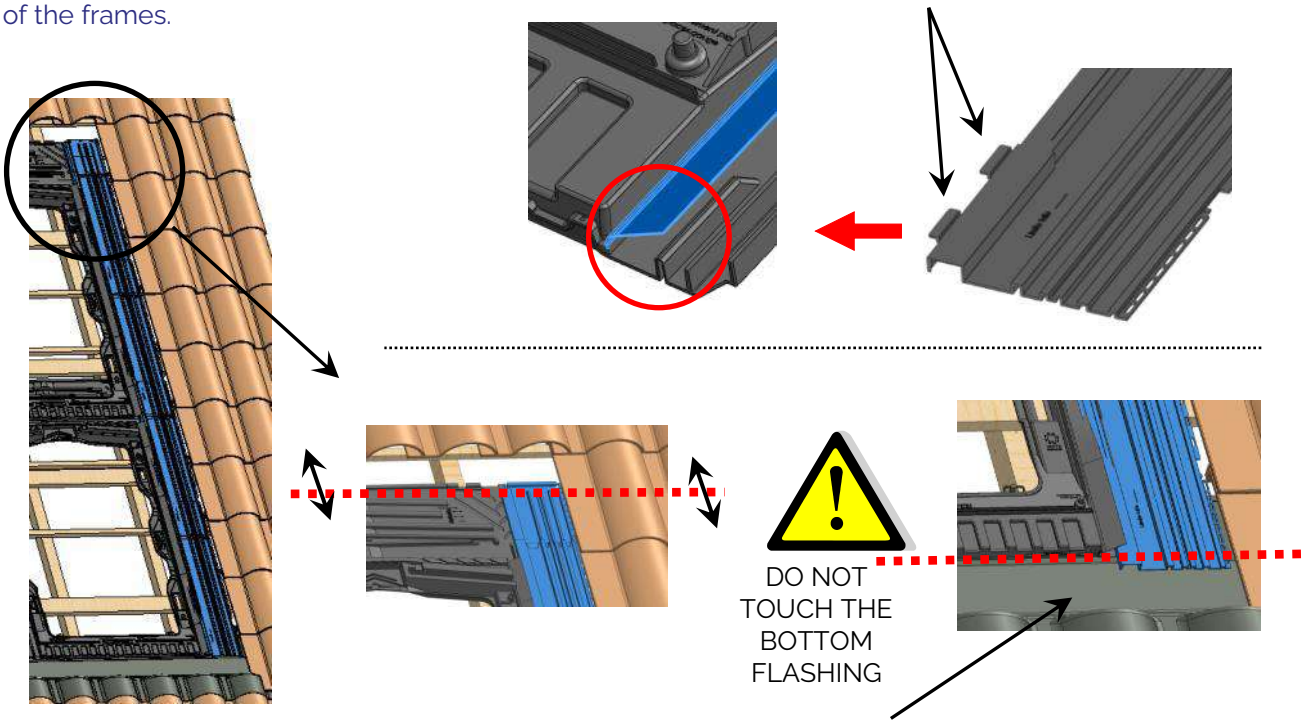


d°) Optional : Clip the frieze support at the top of the last flashing.

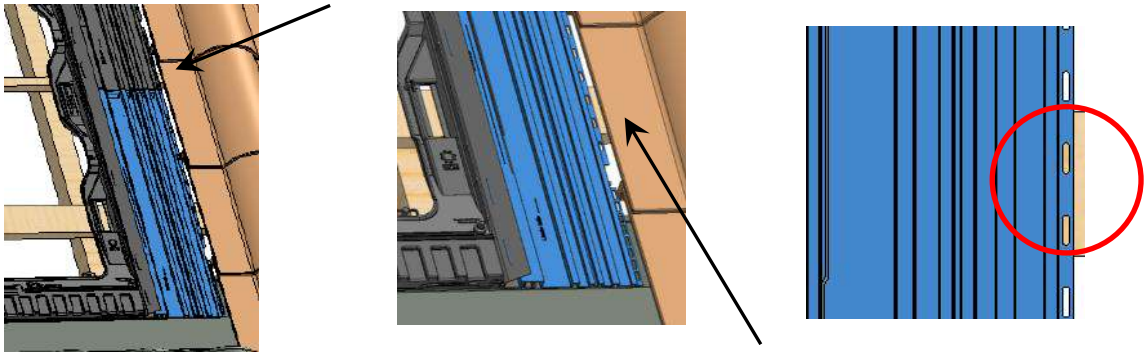


12.4.4) Installation of the EASY-ROOF system

3°) Align the last flashing with the top of the frame. Place the ears of the flashings under the flexible flap of the frames.



4°) At the bottom of the field cut the part of flashing which exceeds the frame if necessary.
5°) Set up a screw convex head 5x30 stainless (b) at each flashing overlap. Screw moderately.

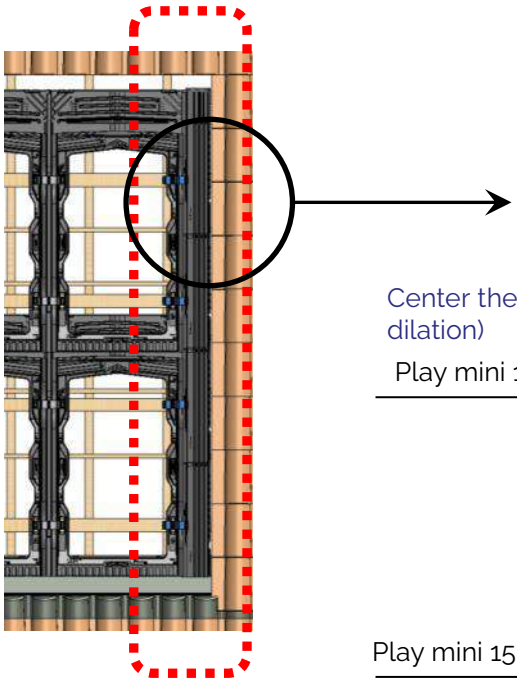


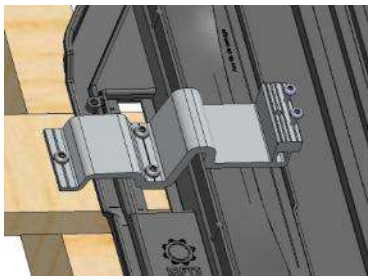
6°) Set up a screw convex head 5x30 stainless (b) centered on the oblong hole. Screw moderately. VERY IMPORTANT, to unscrew one turn, that is useful for the dilation of the part.
7°) If there is no batten under the flashings overlap, add a batten under the overlap.

8°) Fix all right flashings by applying instructions 5.6 and 7.

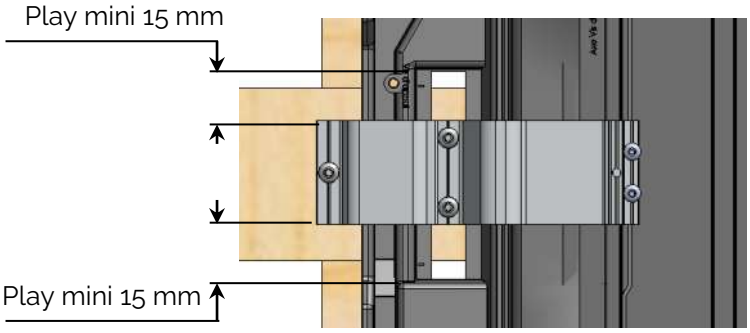
12.4.5) Installation of the EASY-ROOF system

1°) Set up all the end bracket (8) on the right of PV field. Interlock each end bracket in the openings on the frames.
2 or 3 end bracket (8) per frames according to the technical recommendations.
Screw with screws 6x40 STAINLESS (9).



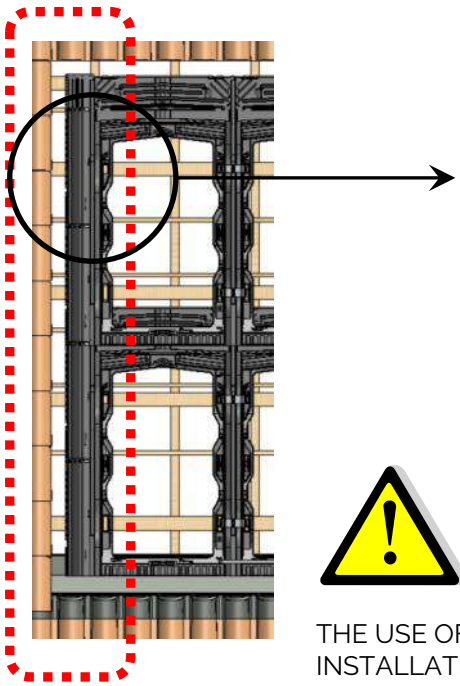


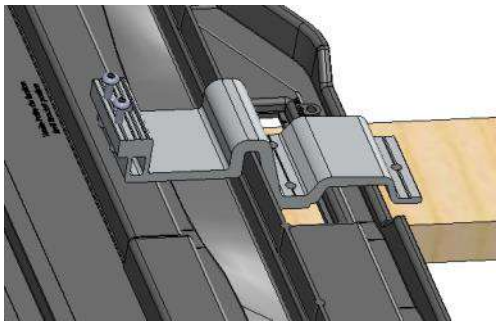
Center the bracket in the vertical direction in the positioning hole (for dilation)



12.4.5)

1°) Set up all the end bracket (8) on the left of the PV field using a mounting tool (13) according to the procedure describes hereafter.

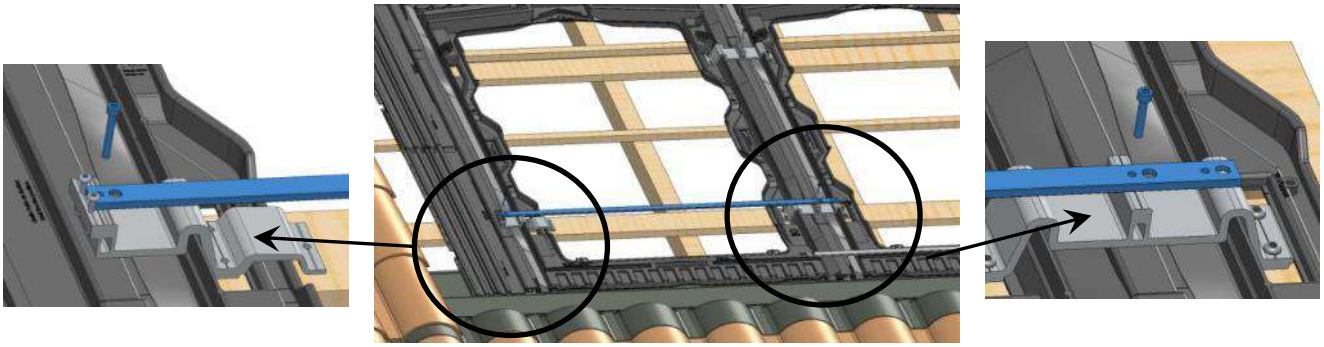


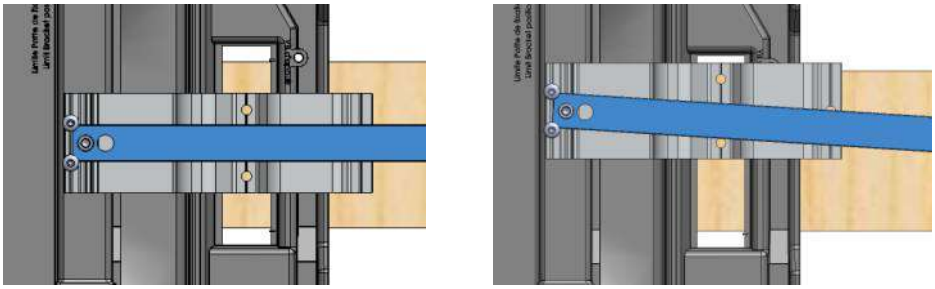


THE USE OF A MOUNTING TOOL IS MANDATORY FOR THE INSTALLATION OF THE END BRACKET ON THE LEFT SIDE OF THE PV FIELD.

12.4.5) Installation of the EASY-ROOF system

1°)Fix one end of the mounting tool (13) on the middle bracket of the same frame using a screw CHc M6 (10 or 11). Screw some threads only.
2°) Position an end bracket (8) in the opening on the frame.
3°) Fix the other end of the mouting tool (13) on the end bracket (8) using a screw CHc M6 (10 or 11). Screw some threads only.
4°) Align the end bracket (8) with the mounting tool (13).
5°) Screw the end bracket (8) with screws 6x40 STAINLESS (9).
6°) Remove the mouniting tool (13).
7°) Carry out the pose of all other end bracket (8) on the left side of the PV field by repeating the operations from 1 to 6.



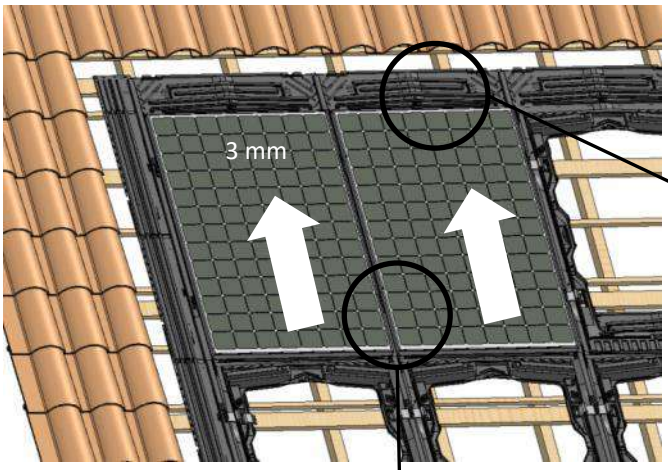


12.5) Installation of the PV modules

The PV connectors are fixed and secured in a dry zone on the top of the support battens (mandatory for the EASY ROOF EVOLUTION system). Moreover they must not touch nor interfere with the breather membrane situated underneath.

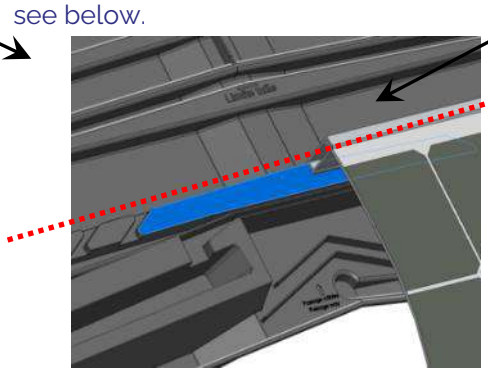
12.5) Photovoltaic Modules installation.

1°) Position the photovoltaic modules. For grounding, see page 54.

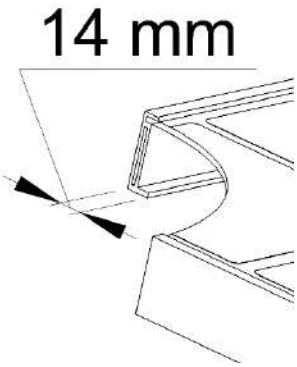


a°) For PV modules with a back frame ≥ à 31 mm, raise the module by 3 mm.

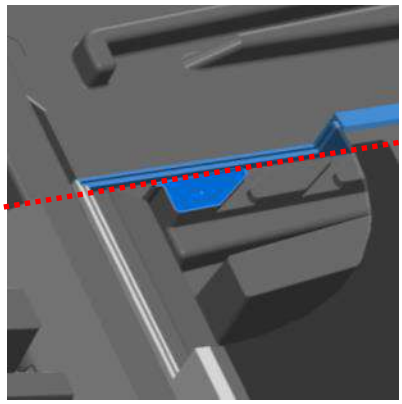
b°) Fpr PV modules with a back frame > 14 < 31 mm, align the upper end with the red marking; see below.



(Local Cut on PV module)



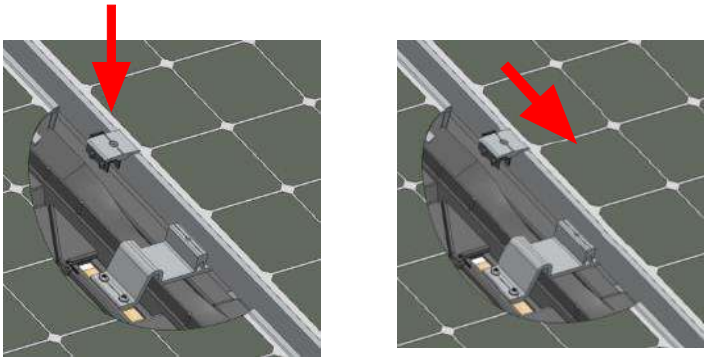
c°) For PV modules with a back frame ≤ à 14 mm, align the back frame as indicated here.



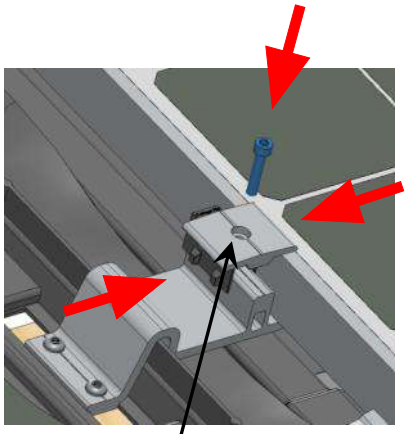
(Local Cut on PV module)

2°) Position the middle clamp (5 or 6) with the module wedge above the middle bracket between two module, the clamp leaning against the PV modules.
3°) Slide the clamp downwards to interlok it on the middle bracket.

4°) Push the modules against the module wedge.
5°) Screw with a screw CHc M6 X 30 (12) or CHc M6 X 40 (11) according to the thickness of PV module.



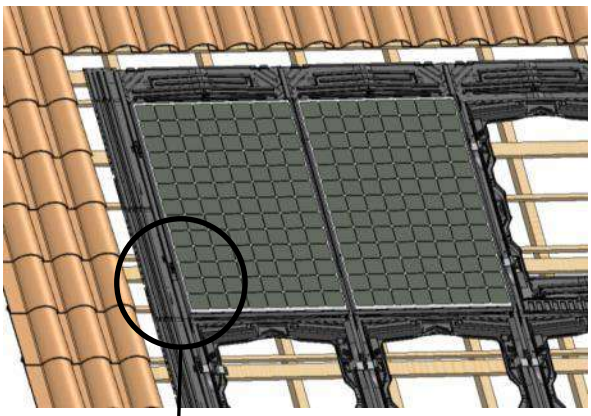
(Local Cut on PV module)



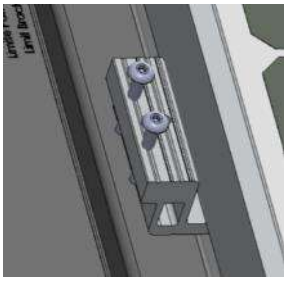
Tightening torque 8.8 Nm

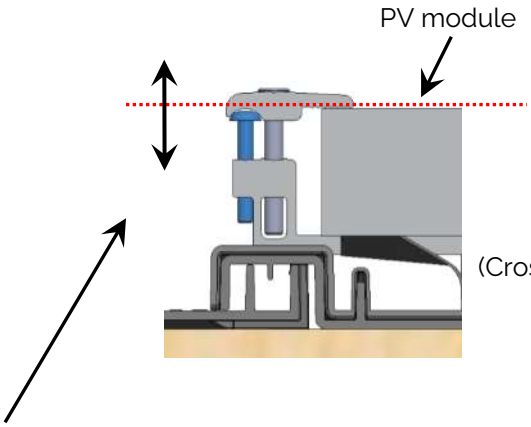
6°) Place all the middle bracket on the PV field

12.5) Installation of the EASY-ROOF system



(End bracket)

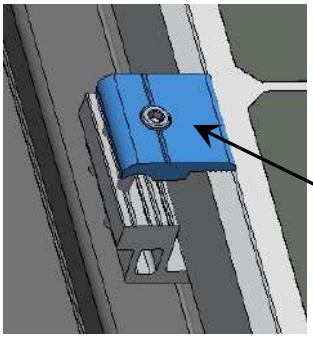




(Cross-section)

1°) Adjust the height of the screws on the end bracket so that they are flush with the top of the PV module.

2°) Fix the PV modules with the end clamps (4) using screws CHc M6 X 30 (12) or CHc M6 X 40 (11) according to the thickness of the PV module.



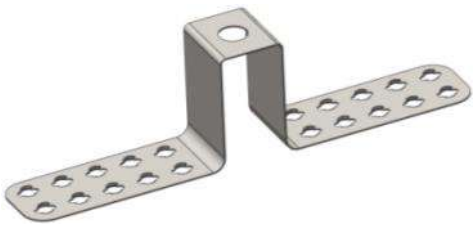
Tightening torque 8.8 Nm

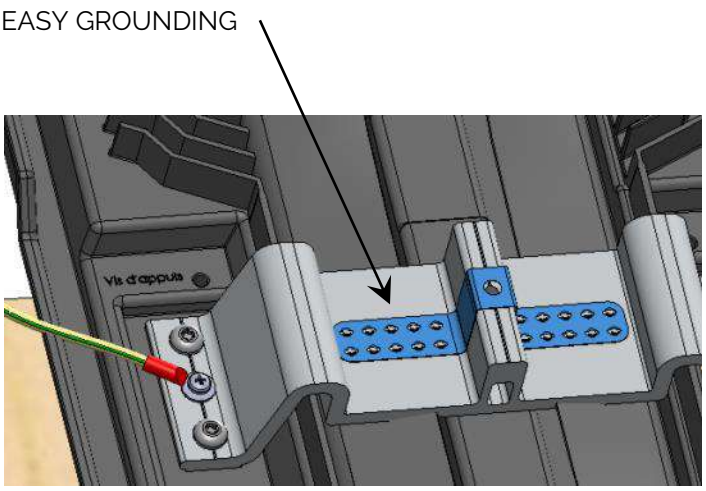
(End clamp)

12.5.1) Grounding

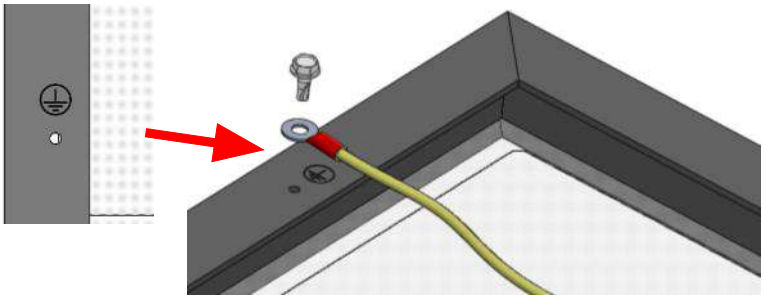
If grounding is not done by connecting the ground wire directly to PV module, carry out the following operations.
1 ˚) Locate the middle bracket connected to the ground during the assembly.(see p. 44)

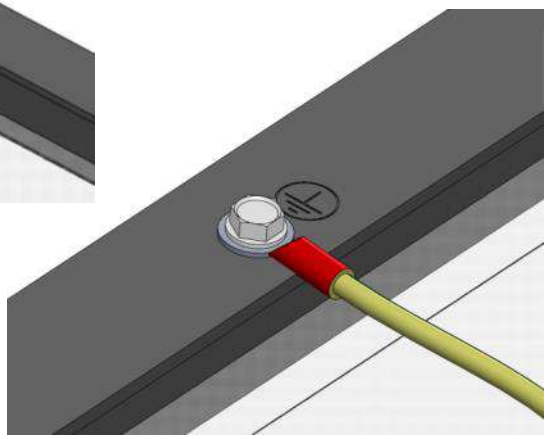
Option 1˚)
Place the EASY GROUNDING on the middle bracket





Option 2˚)
Link the PV module directly to the grounding wire using the holes provided by the constructor underneath the module.



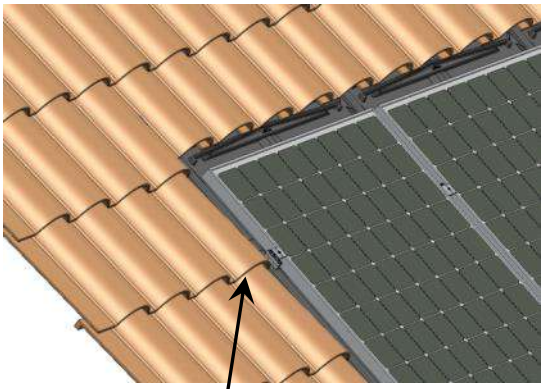


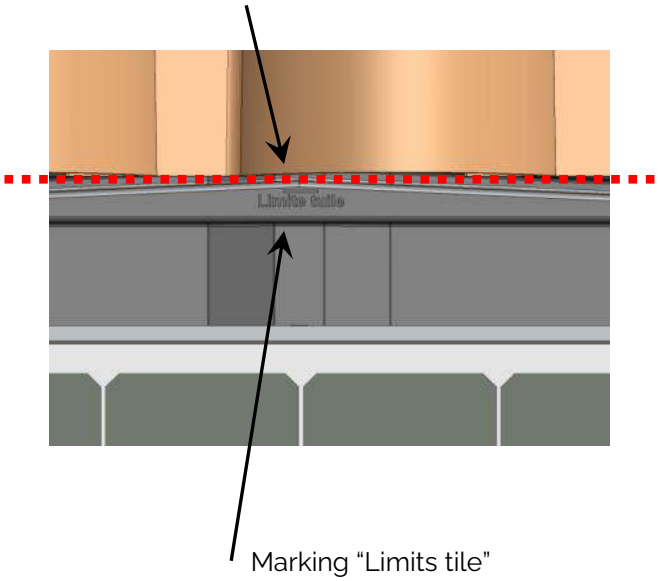
2˚) Make sure then that connection between the PV module and the bracket(5) is less than 2 Ohms.

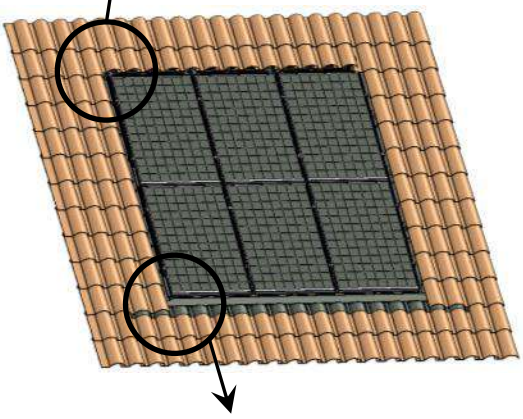
12.6) Put back the tiles

Put back the tiles, covering the top flashing up to he marking indicating “Limit tile”.

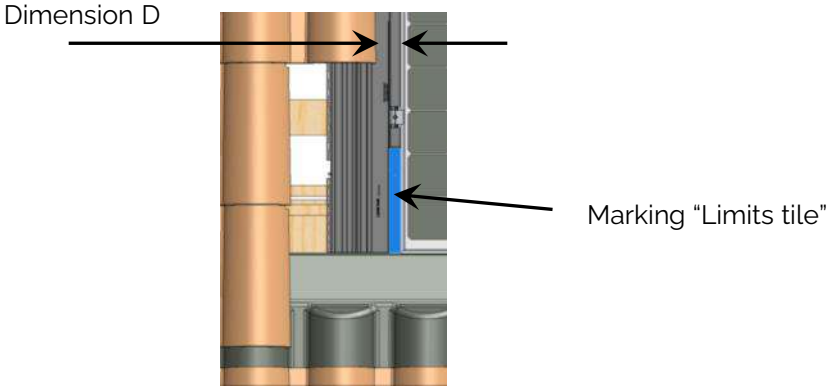
IMPORTANT: For the tiles with high profile, it is imperative to set up a self-adhesive foam band on the top flashing before replacing the tiles.







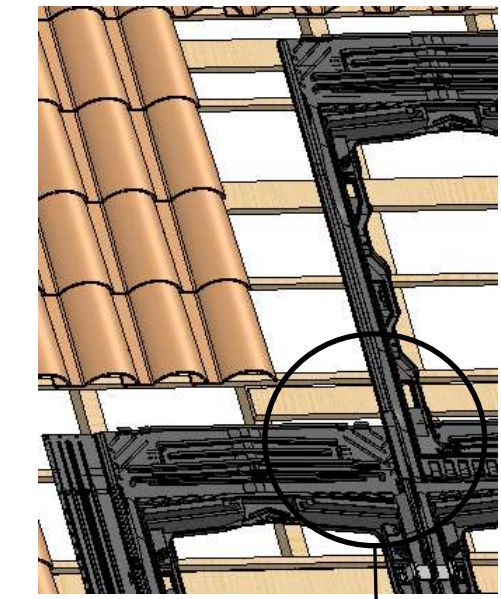
For the covering of the side flashings (2) and (3), the edge of the tiles have to be as close as possible to the marking indicating “Limit tile”.
It is imperative that the dimension D does not exceed 40 mm MAXIMUM

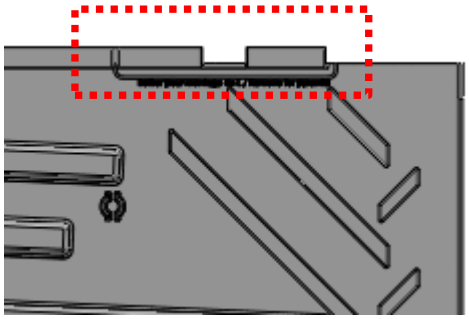


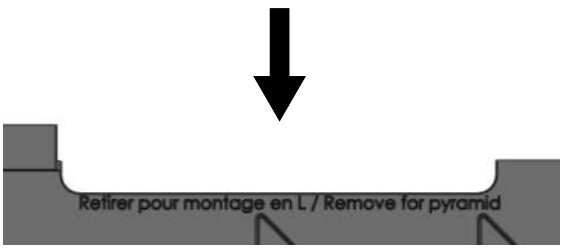
Annex n° 1 Pyramidal installation

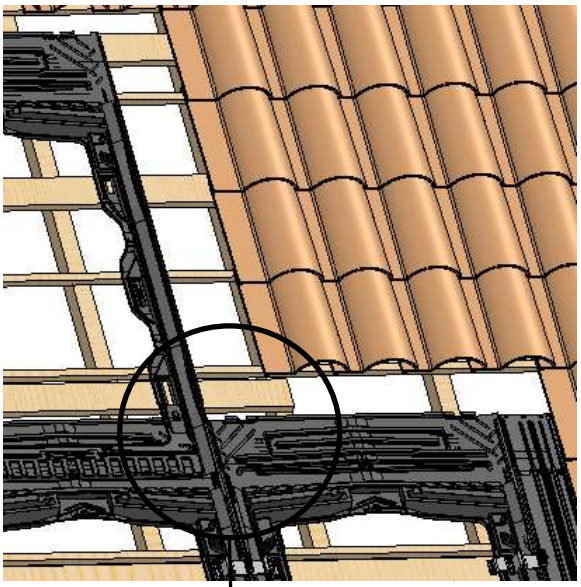
A°) Flashing installation in "L" left or right

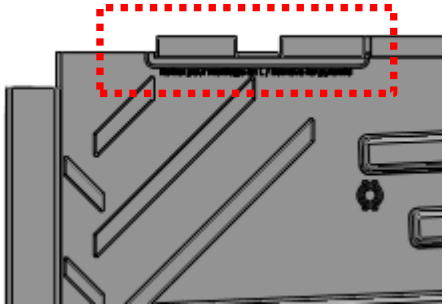
1°) Pull out the removable part at the top corner of the frame.

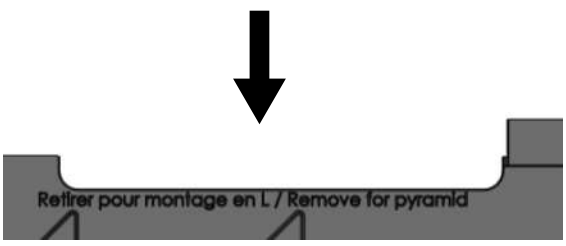








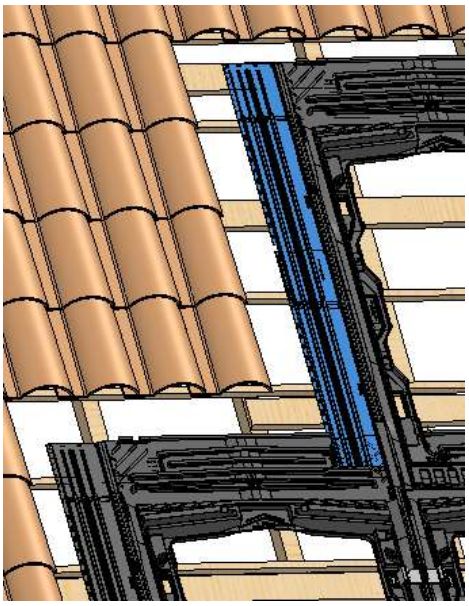


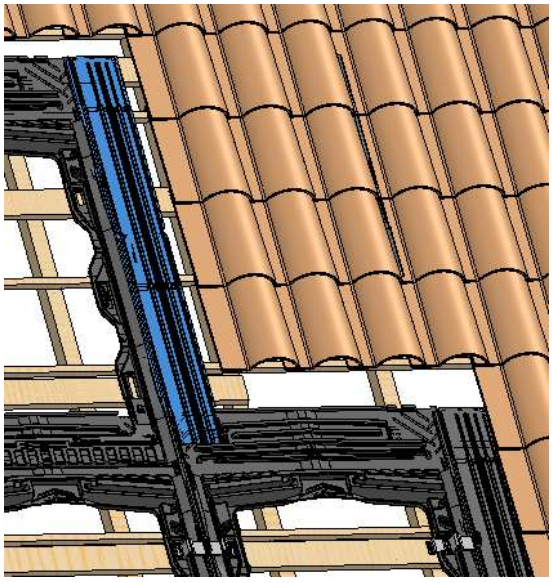


Annex n° 1 Pyramidal installation

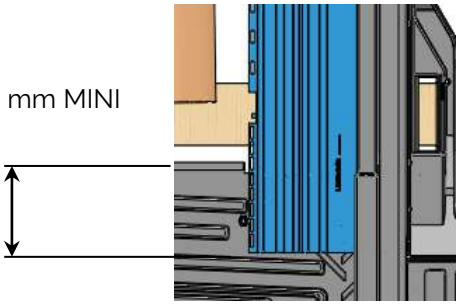
A°) Flashing installation in "L" left or right

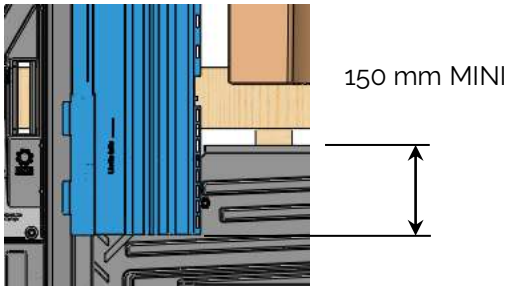
2°) Assemble and install the flashings as explaned page 46 to 49 in the general datasheet.





3°) Cut the lower flashing in order to overlap the frame 150mm Minimum.

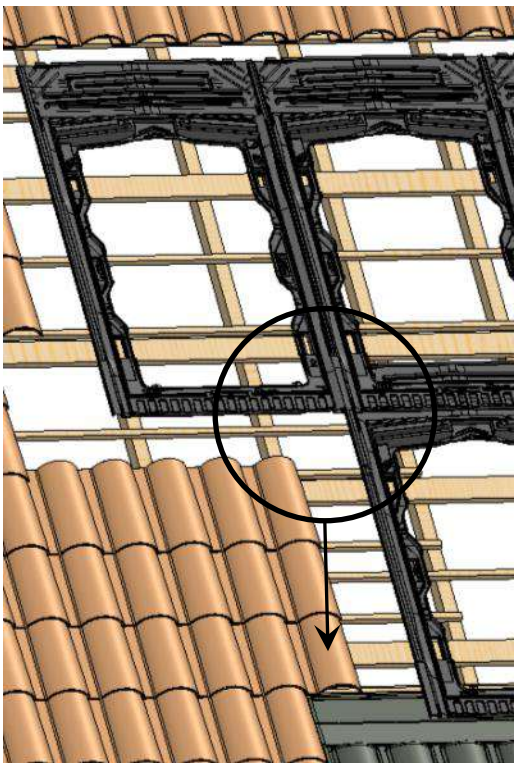


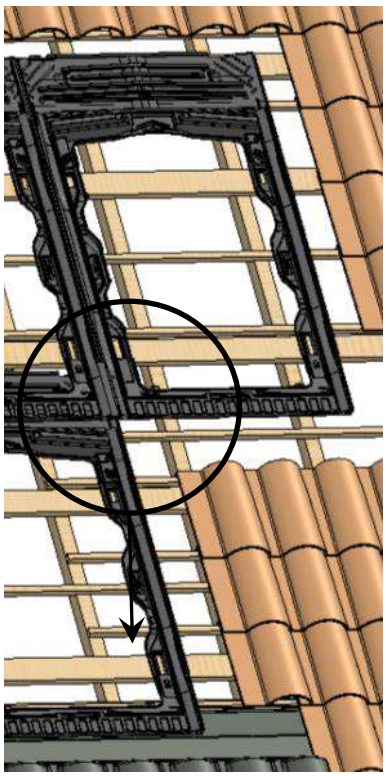


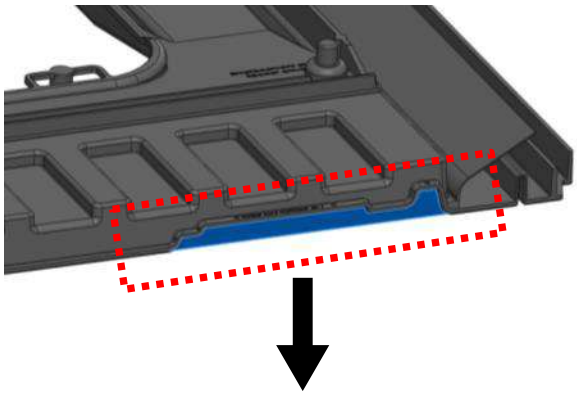
Annex n° 1 Pyramidal installation

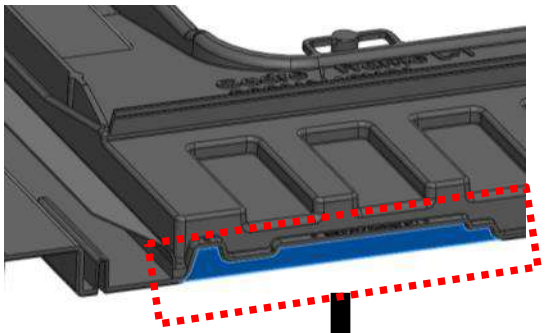
B°) Flashing installation in "T" left or right

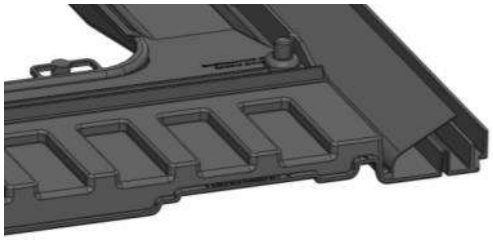
1°) Pull out the removable part at the bottom corner of the frame.

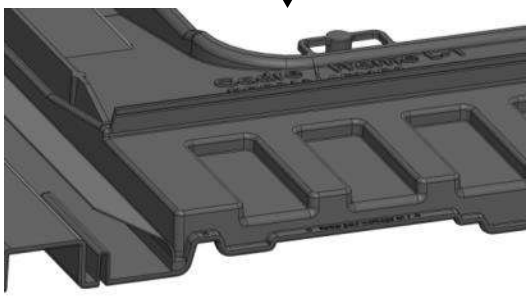








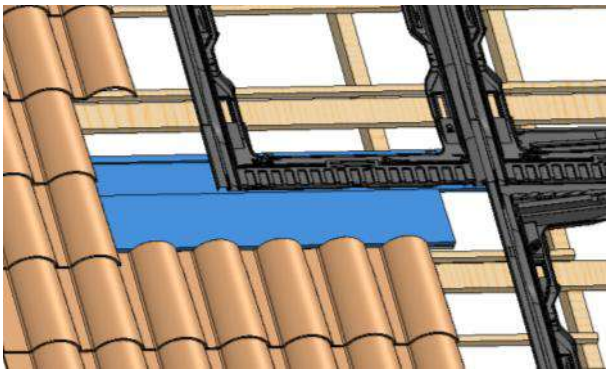


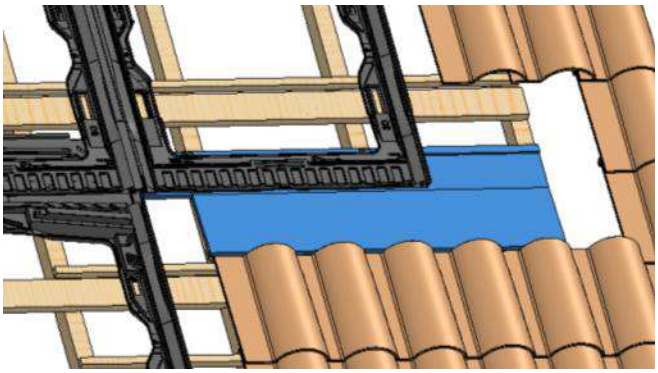


Annex n° 1 Pyramidal installation

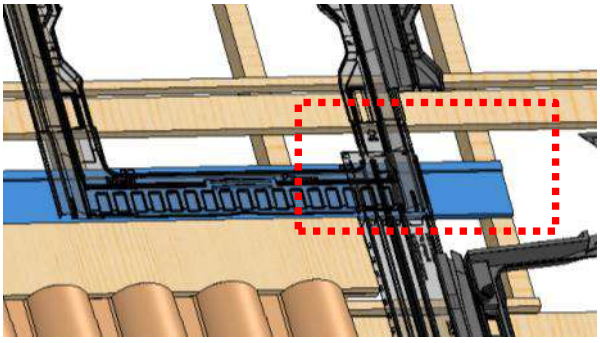
B°) Flashing installation in "T" left or right

2°) Do the flooring for the bottom flashing, size the batten as describe in the general datasheet page 25 to 27.

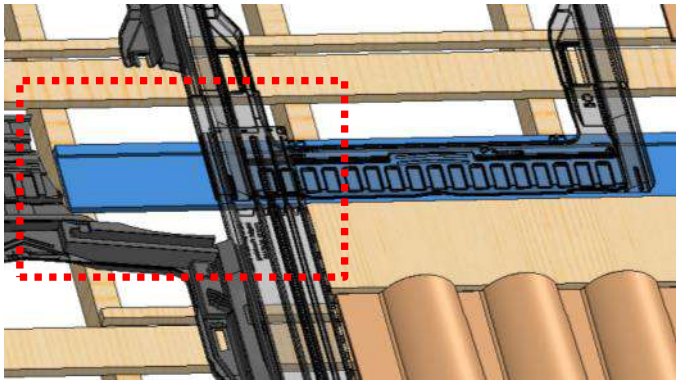




3°) The batten (E) and (G) should be long enough to support the flashing.

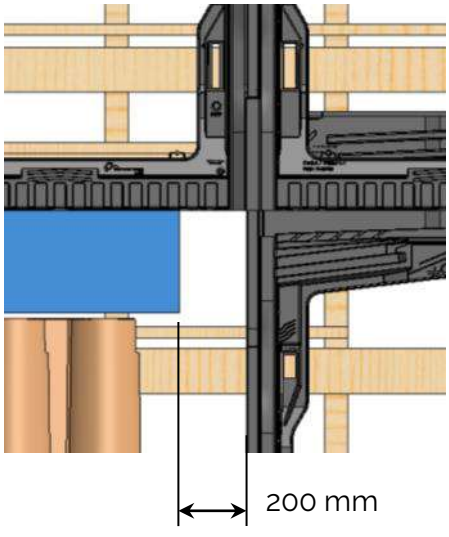


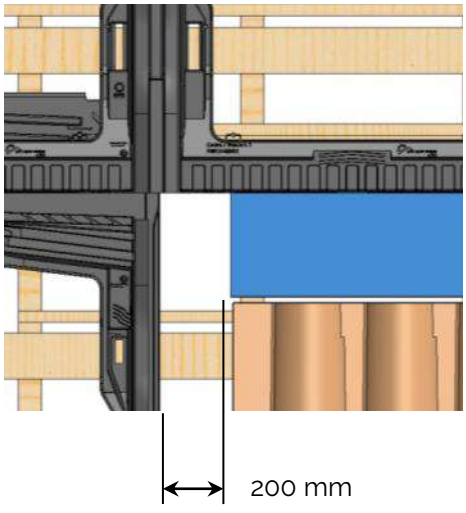
(frame local cut view)



(frame local cut view)

4°) Place the batten (K) at 200m from the frame (space needed for the flashing)

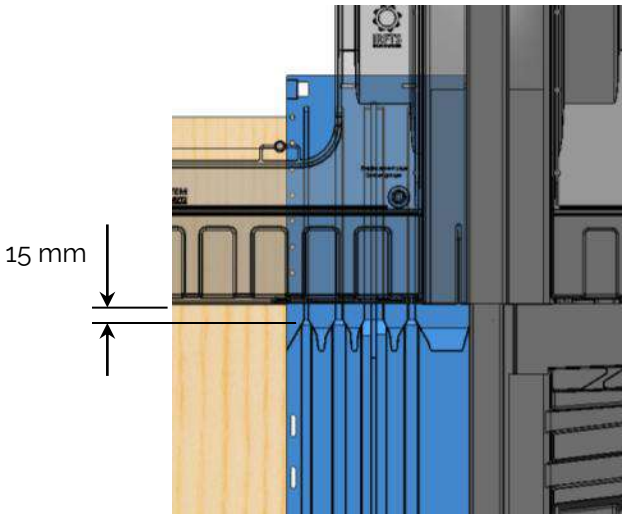


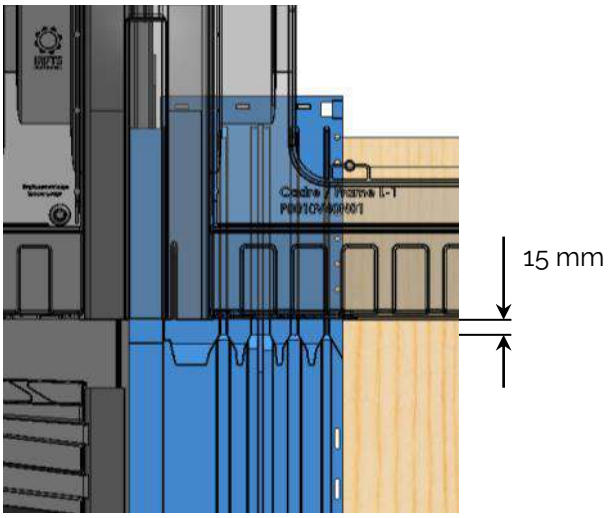


Annex n° 1 Pyramidal installation

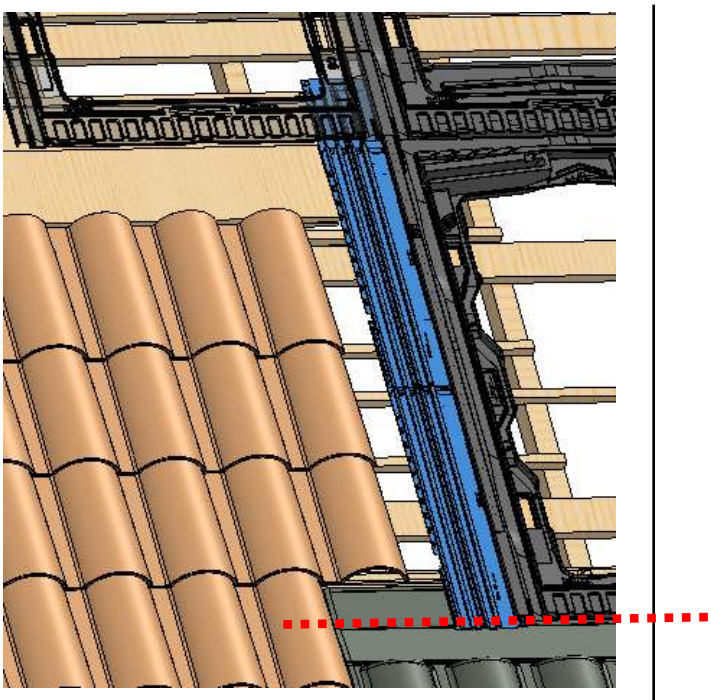
B°) Flashing installation in "T" left or right

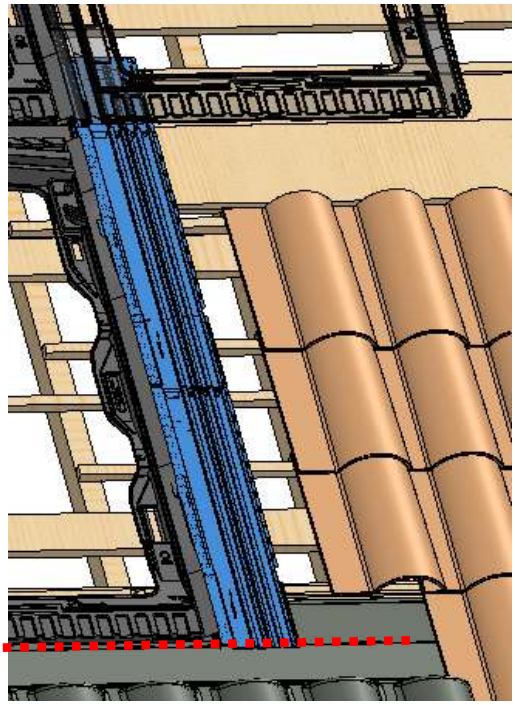
5°) Place the flashing like on the drawing below, respect the 15mm distance with the frame.





6°) Assemble and place the flashing as describe in the general datasheet page 46 to 49.
7°) Cut the exceeding part of the flashing in order to align with the bottom of the frame.

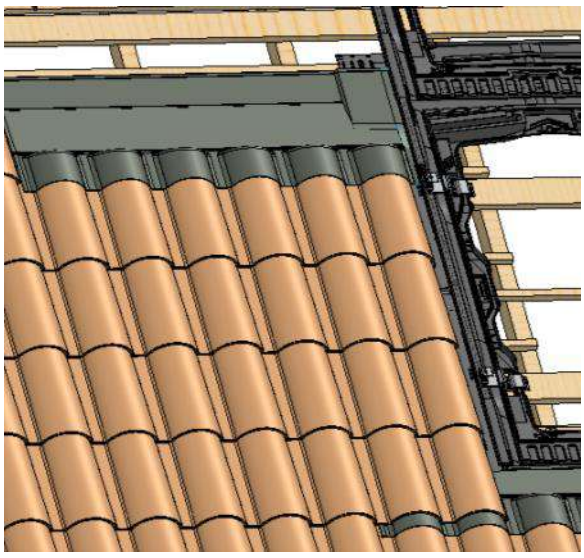


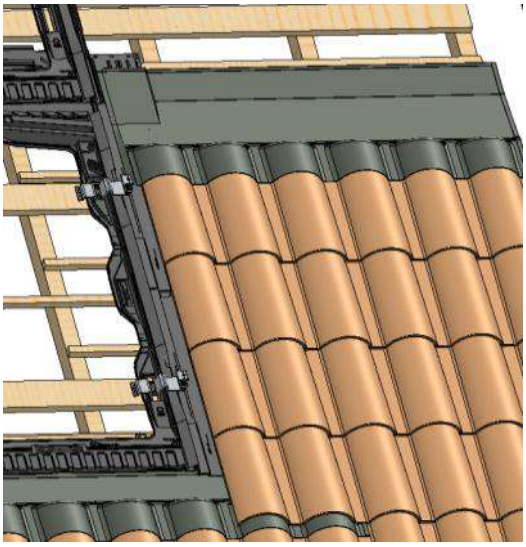


Annex n° 1 Pyramidal installation

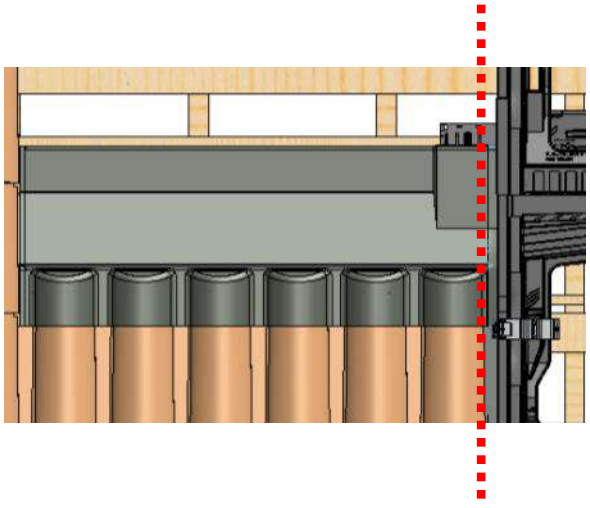
B°) Flashing installation in "T" left or right

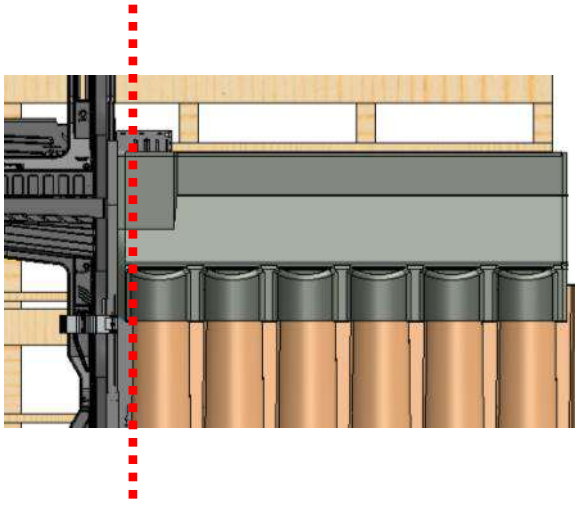
8°) Put the end bracket.
9°) Replace the tiles on the flashing.
10°) Place the bottom flashing as describe in the general datasheet page 27, respect the Minimum overlap.





11°) Align the bottom flashing with the last tile.

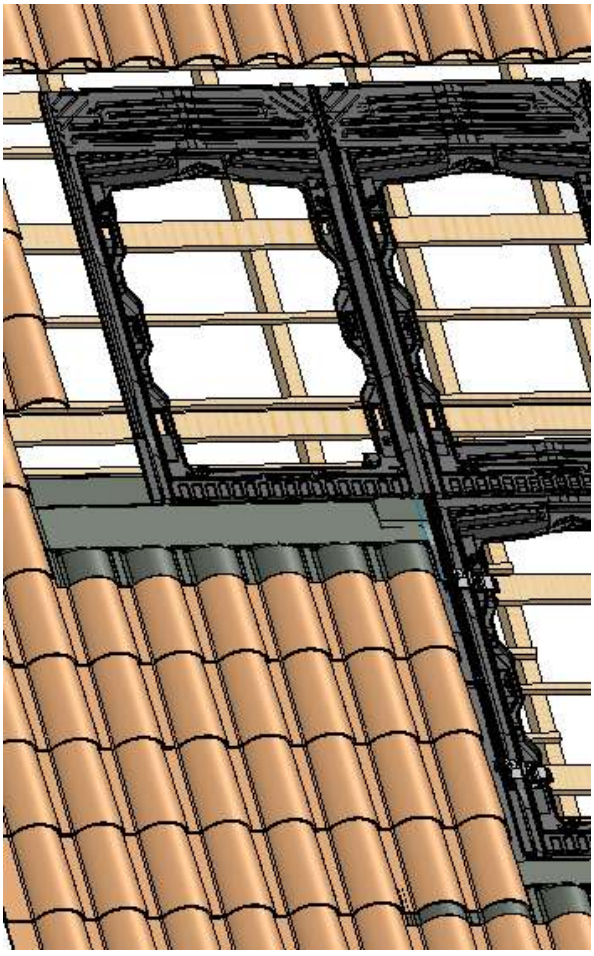


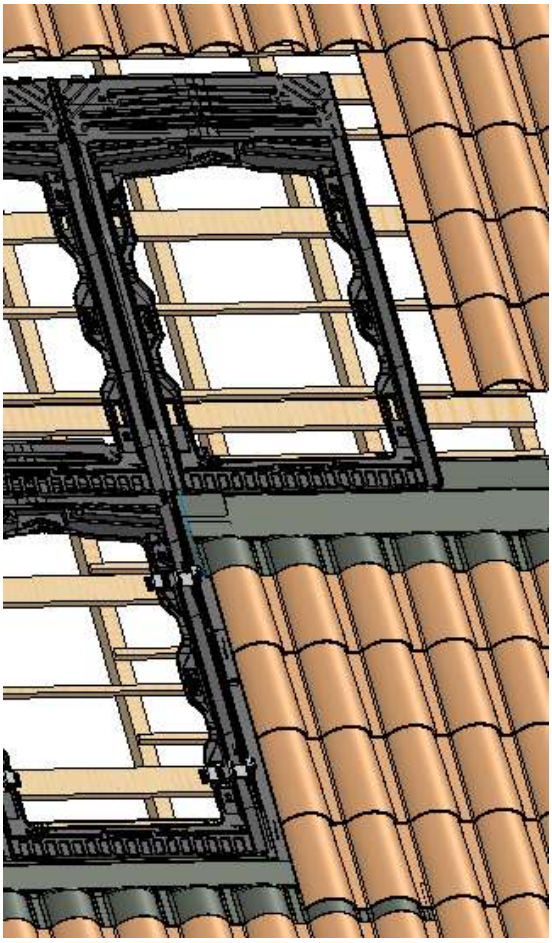


Annex n° 1 Pyramidal installation

B°) Flashing installation in "T" left or right

12°) Put the superior frame and fix the other element as describe in the general datasheet.

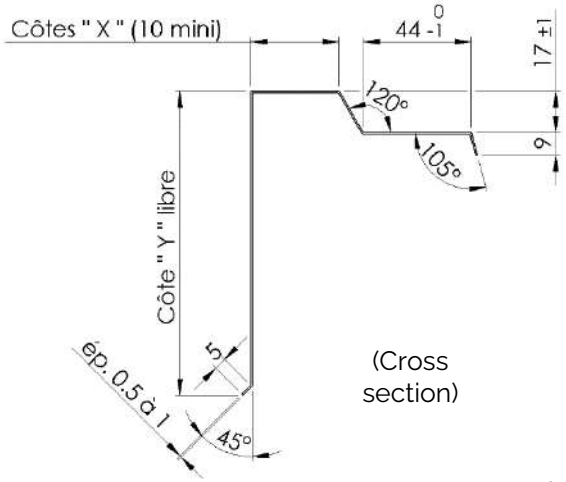




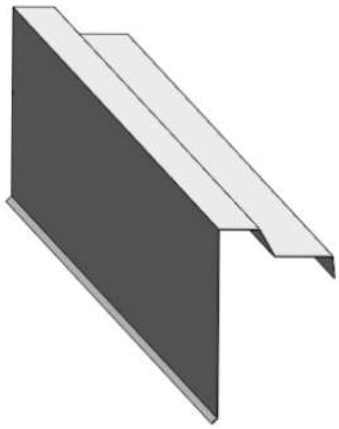
Annex n° 2 Lateral Edge installation

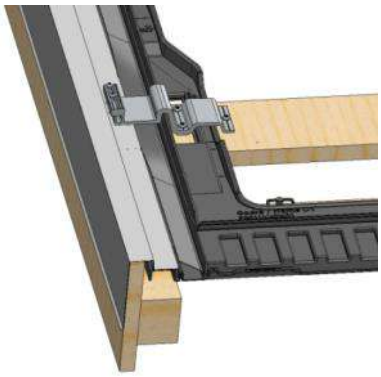
A°) Lateral Edge metal sheet definition

Left and Right Lateral Edge metal sheet have the same shape.
The « X » dimension may be different according to distance between the Easy Roof frame and the lateral edge batten. « X » must be be 10mm Minimum.
The « Y » dimension must be adapted to the needed overlap.
The Lateral Edge metal sheet will be placed before the end clamp installation.

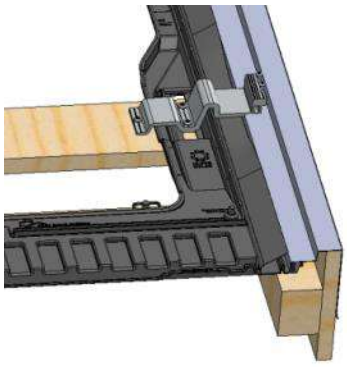


(Cross section)

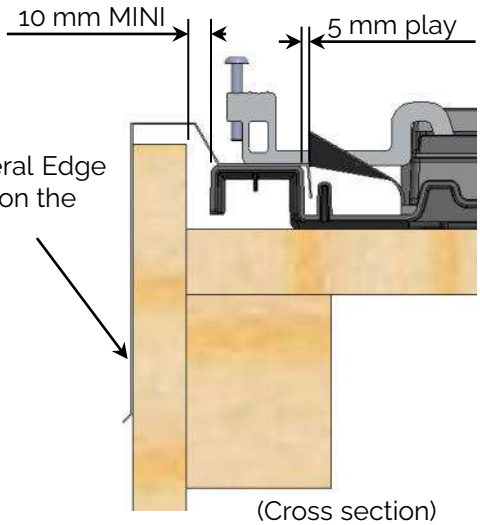




(Cross section)

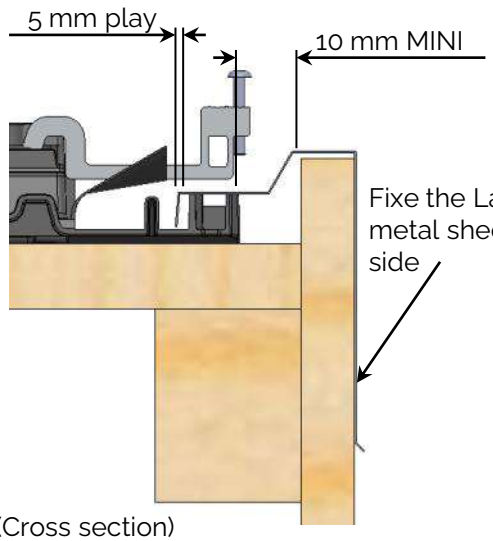


(Cross section)



Fixe the Lateral Edge metal sheet on the side

(Cross section)



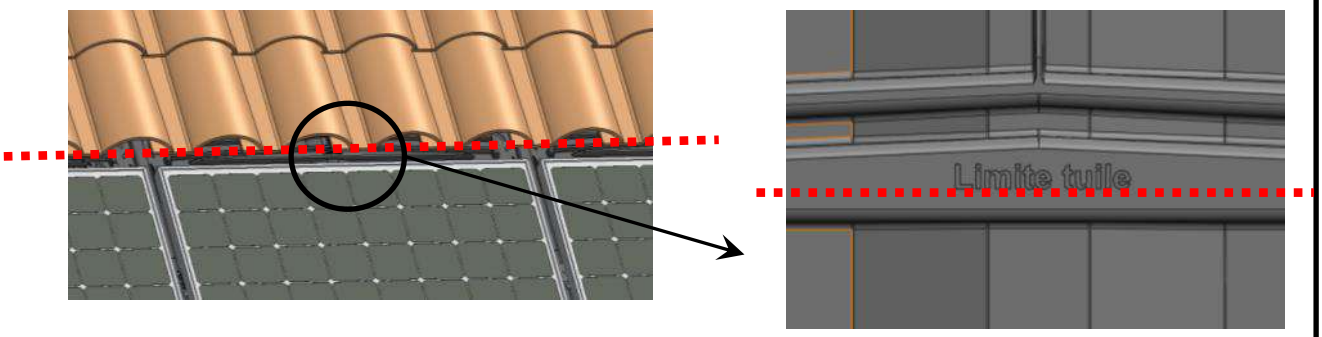
Fixe the Lateral Edge metal sheet on the side

(Cross section)

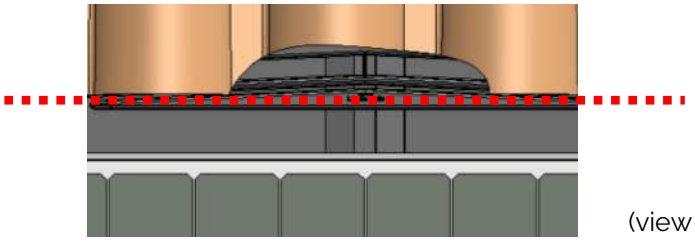
Annex n° 3 Tile's alignment over the Top Flashing

A°) 3 possible cases

Spot the marking "Limite tuile" on the EASY ROOF frame

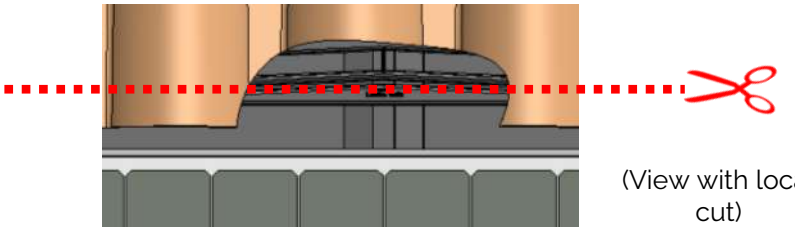


1°) The tile's bottom is tangent with marking « Limite tuile »
Optimal overlap respecting the manufacturer recommendation.



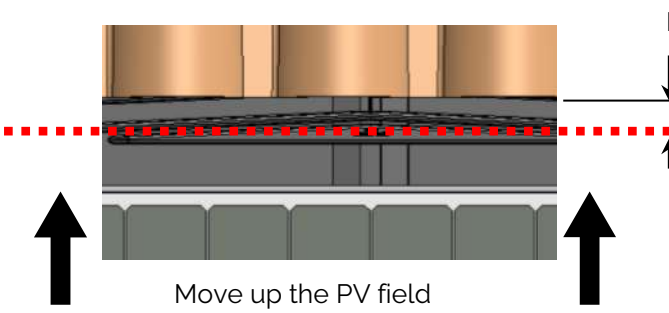
(view wih local cut)

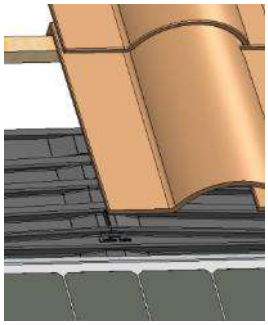
2°) The tile is too long.
Cut the tile to align the tile's bottom with the marking « Limit tuile ».



(View with local cut)

3°) The tile is too short.
The tile must overlap the top flashing with a minimum of 150mm.
If the « R » dimension » (distance between the marking « Limite tuile » and the tile's bottom) is higher than 70mm, move up the PV field. In that case the dimension « A » will be increased, see page 14.

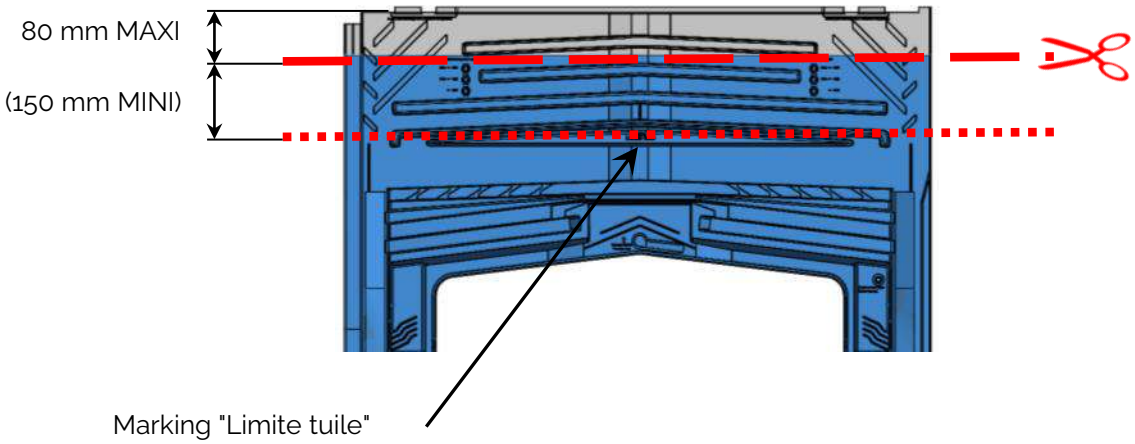




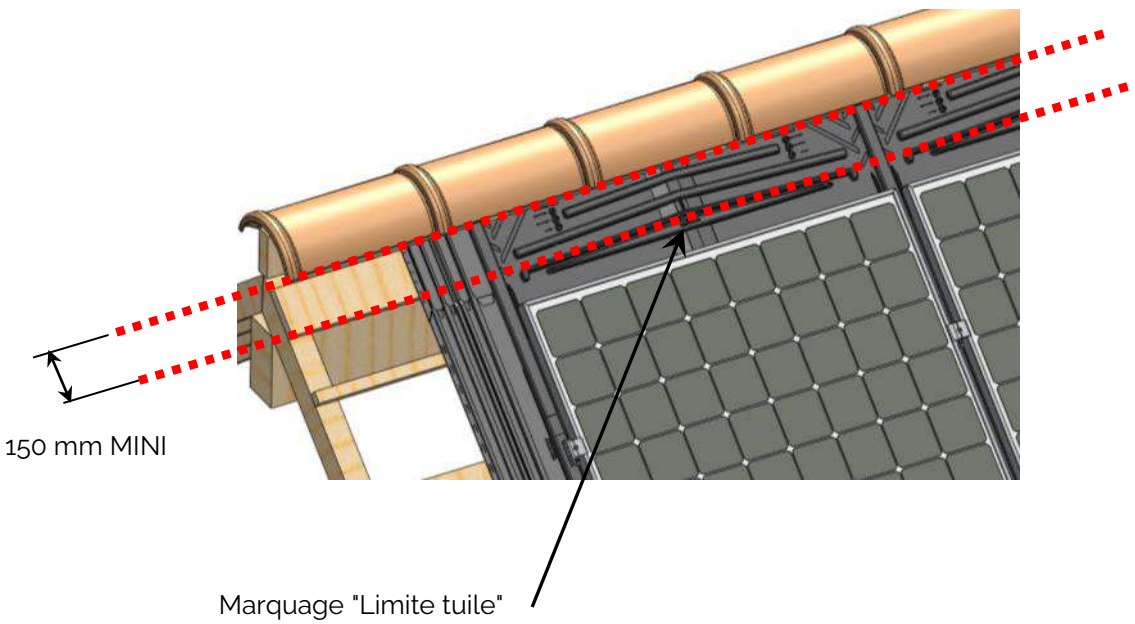
Annex n° 3 Tile's alignment over the Top Flashing

B°) Ridge installation

1)° If needed the top of the frame can be cut 80mm maximum.
150mm minimum st be kept above the marking « Limite tuile ».

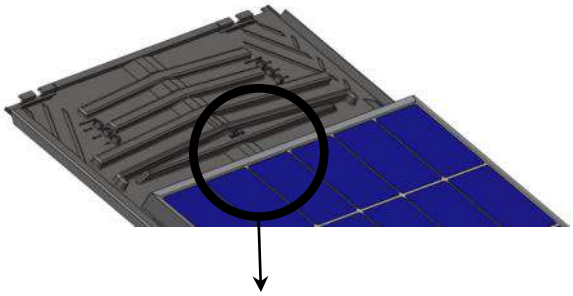


2°) Make sure the tiles or a watertight strip overlap the top of the frame with 150mm minimum.

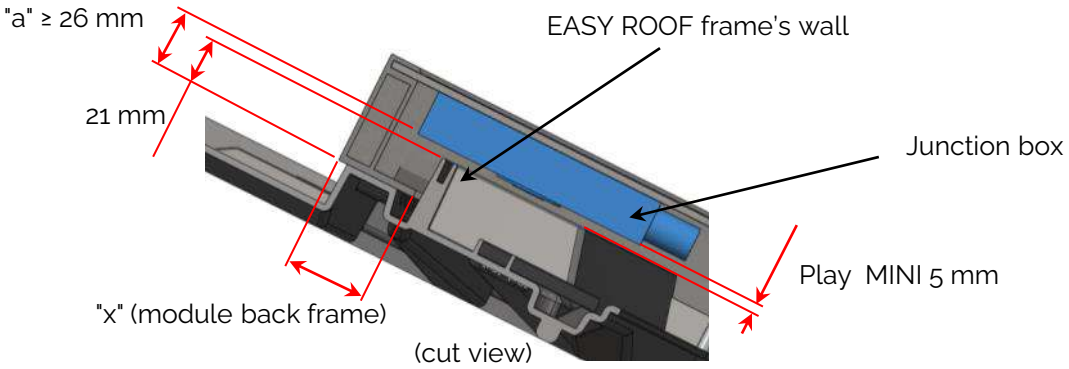


Annex n° 4 Compatibility module

Make sure the module you choose for the installation is compatible with the EASY ROOF system, (you can check compatibility on www.edilians.co.uk).
Check the junction box position, one of the 3 following condition must be true to install the junction box at the top.
In the other case for an easier installation place the junction box at the bottom*.
For junction box with lateral ouput, we recommend to install it at the bottom*.
*Please check that this mounting option is compatible with the module manufacturer's requirements.

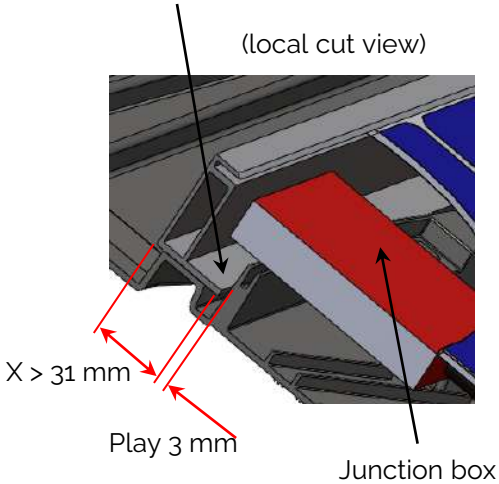


Case n° 1 : The junction box goes above the EASY ROOF frame's wall : Dimension ''a'' must be ≥ 26 mm.

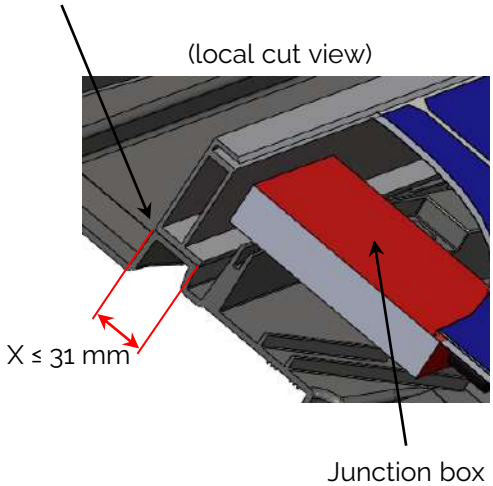


Module position on the system according to back frame dimension (Dimension "x").

a) Module back frame > 31 mm
- Place hte end of the back frame at 3 mm from the ESAY ROOF frame's wall.



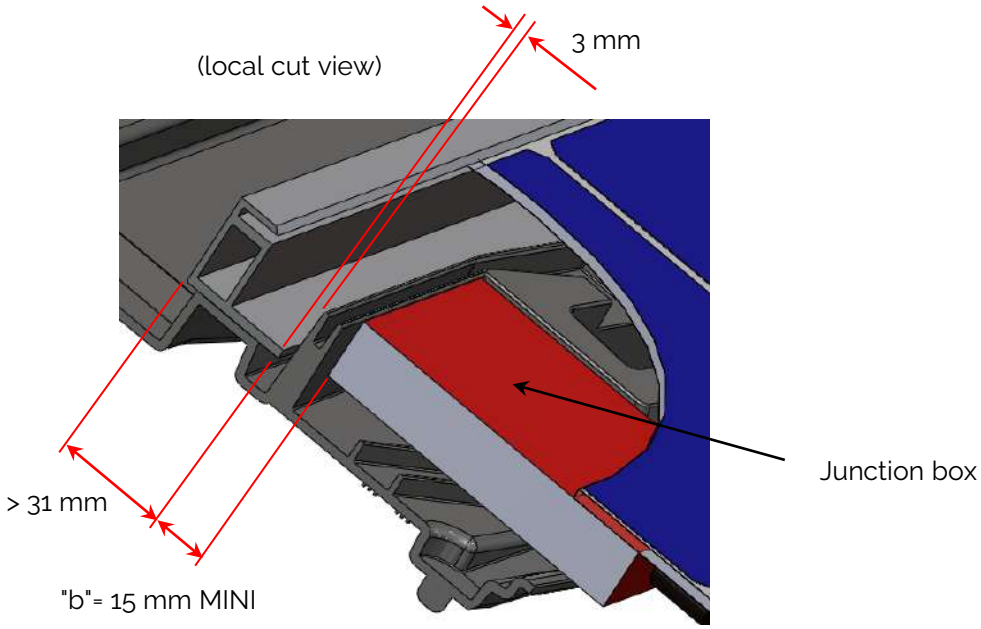
b) Module back frame ≤ 31 mm
- Align the top of the module with the EASY ROOF frame.



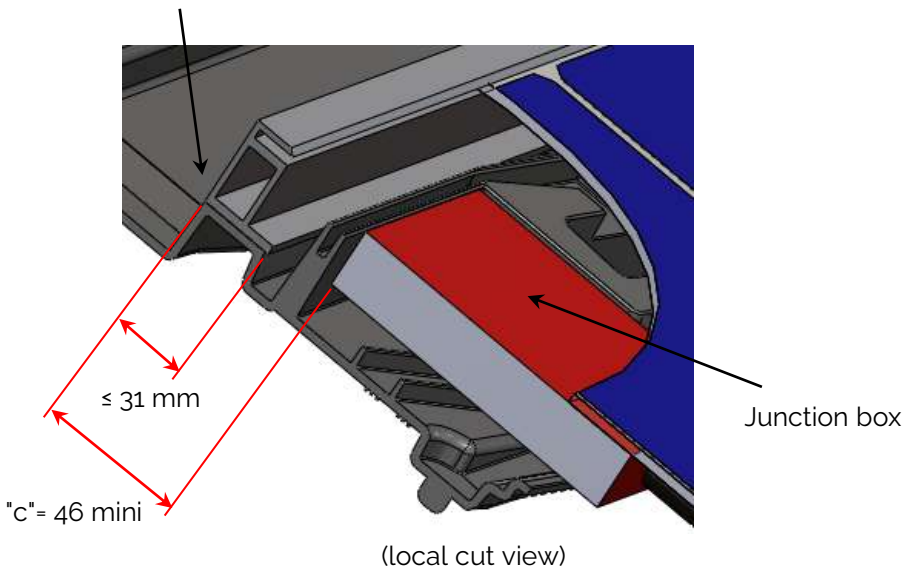
Annex n° 4 Compatibility module

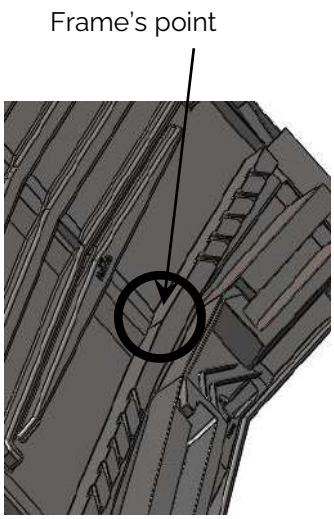
Case n° 2 : If Dimension "a" < 26 mm (case n° 1)
Module back frame > 31 mm : Dimension "b" must be superior to 15 mm.
(The junction box is below the EASY ROOF frame's wall).

- Place the end of the module back frame at 3 mm from the EASY ROOF frame's wall.



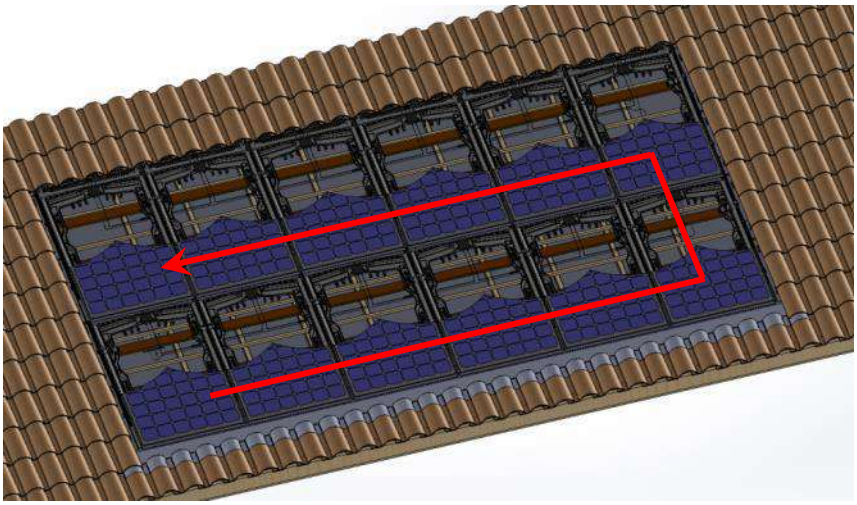
Case n° 3 : If "a" < 26 mm (case n° 1)
Module back frame ≤ 31 mm : Dimension "c" must be superior to 46 mm.
(The junction box is below the EASY ROOF frame's wall).
Align the top of the module with the EASY ROOF frame's point.

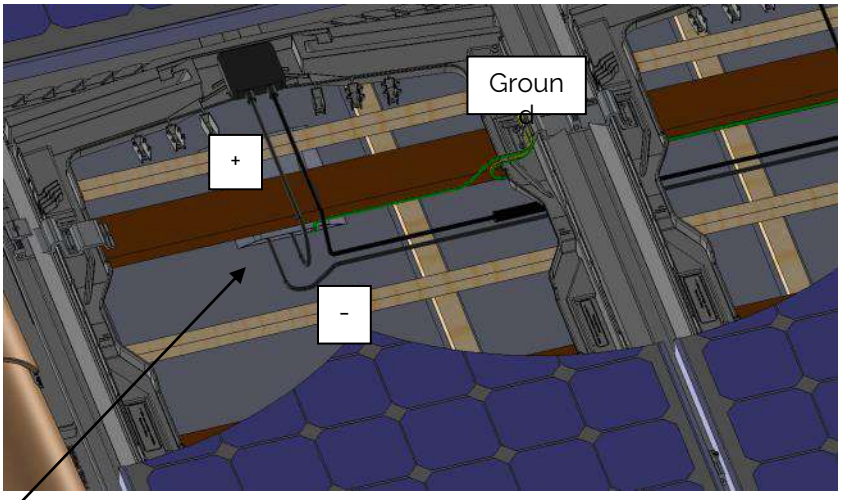




Annex n° 5 Connection of the PV cables and grounding

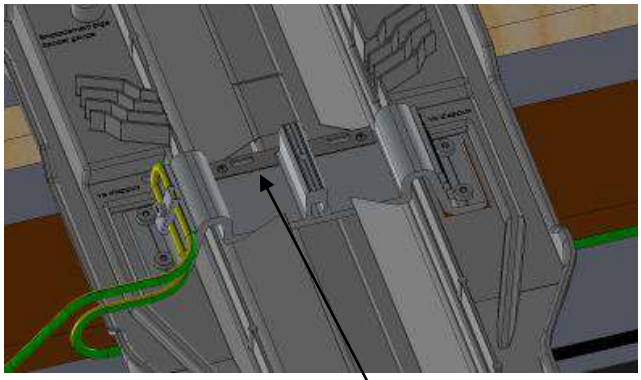
1. EDILIANS claw and EDILIANS self stripping claw
   Wiring without loop





Cables between 2 layers (+ / - nad ground)

Cables coming from the attic between 2 layers of underlayment. The cables directions must be towards the bottom.

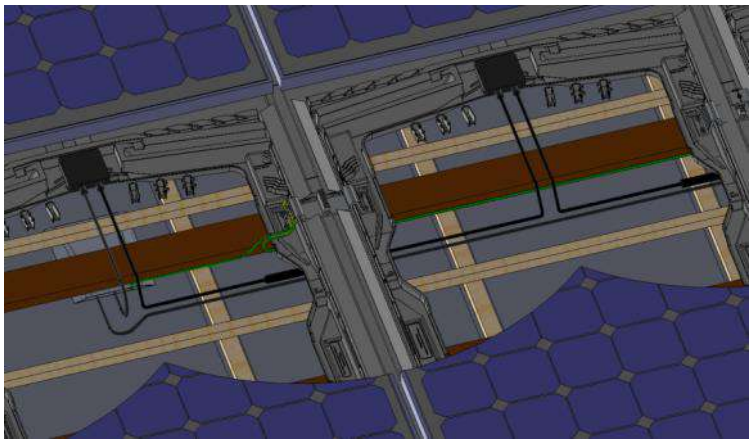


Place the claw on the bracket

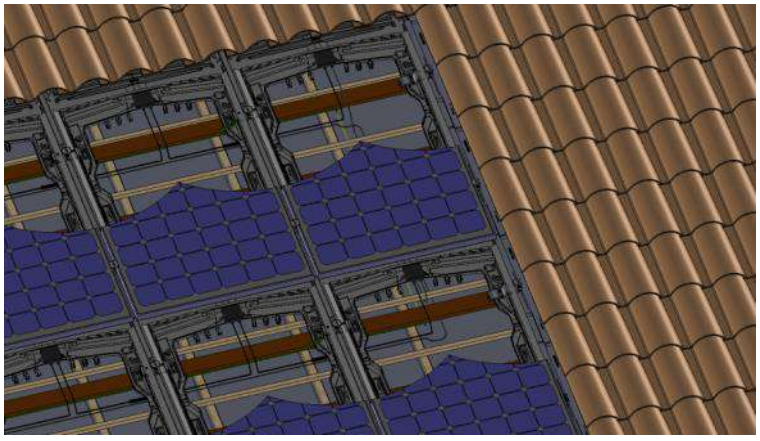
- Wire the ground every 2 brackets.
- Connect the + from the inverter to the – of the first module.

Annex n° 5 Connection of the PV cables and grounding

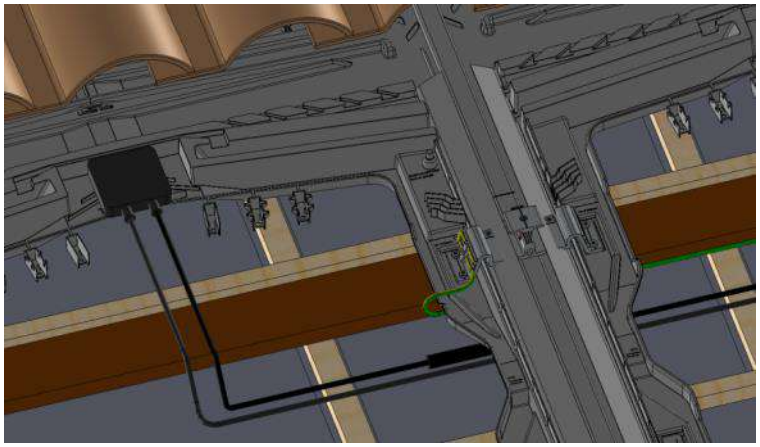
- Connect the module to each other (cable + on cable -).
- Run the – and the ground along these cables in order not do a loop.



- Go to the upper line.

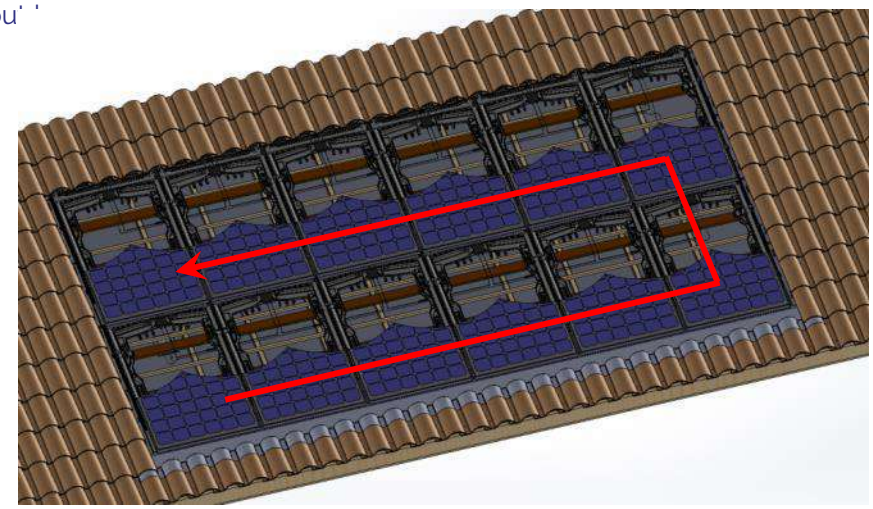


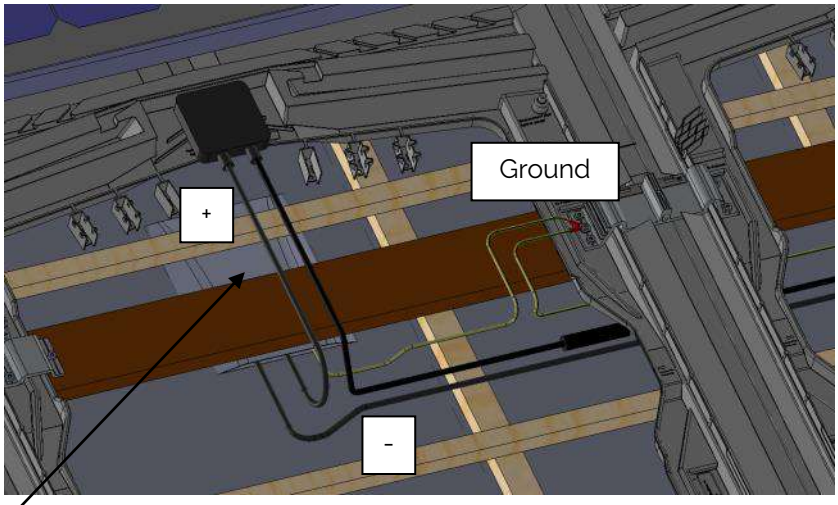
- Connect the last module.



Annex n° 5 Connection of the PV cables and grounding

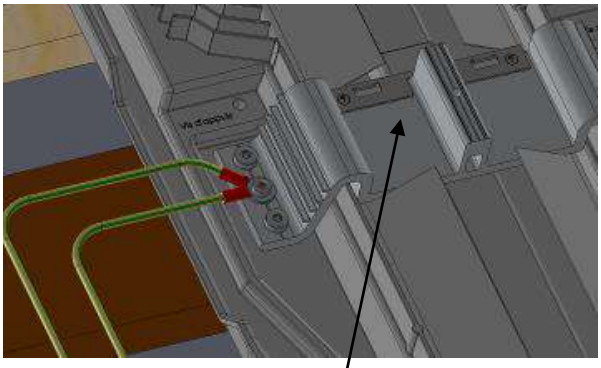
2. EDILIANS claw and self tapping screw into the bracket
Wiring withou' '





Cables between 2 layers (+ / - nad ground)

Cables coming from the attic between 2 layers of underlayment. The cables directions must be towards the bottom.

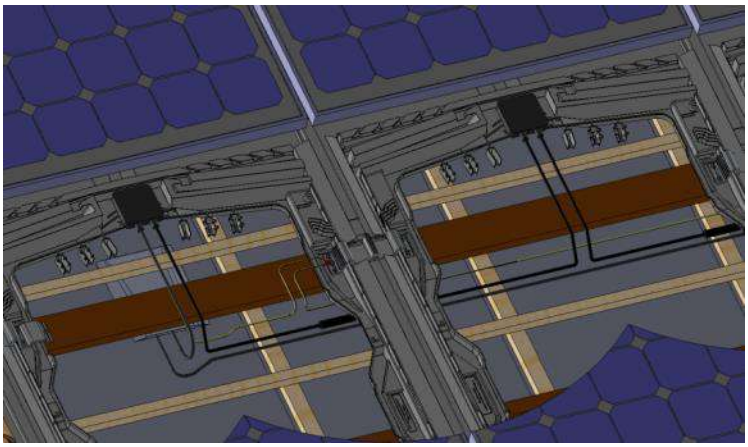


Place the claw on the bracket

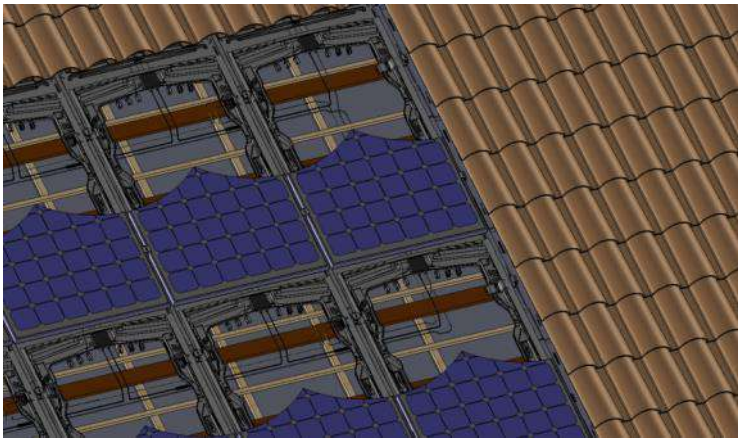
- Wire the ground every 2 brackets.
- Connect the + from the inverter to the – of the first module.

Annex n° 5 Connection of the PV cables and grounding

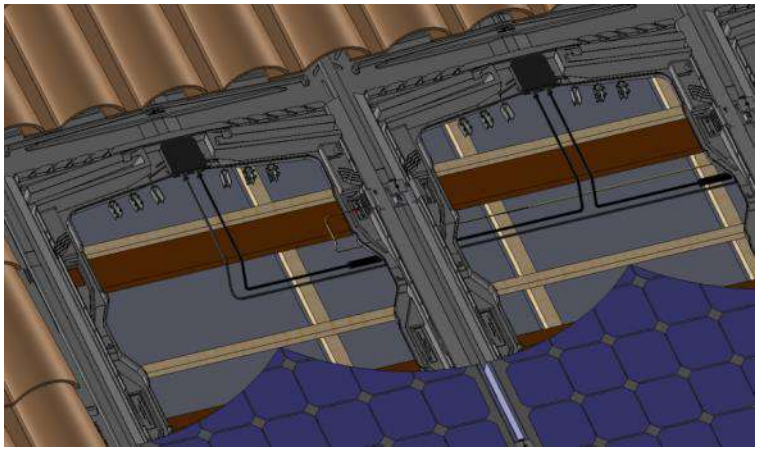
- Connect the module to each other (cable + on cable -).
- Run the – and the ground along these cables in order not do a loop.



- Go to the upper line.

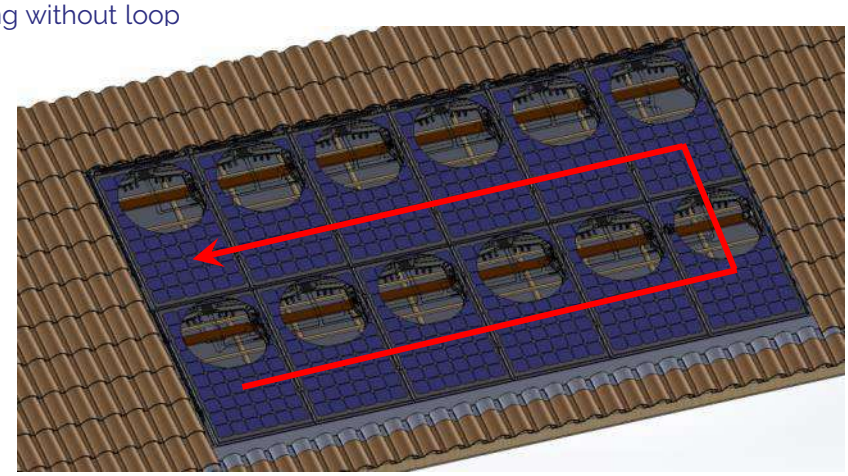


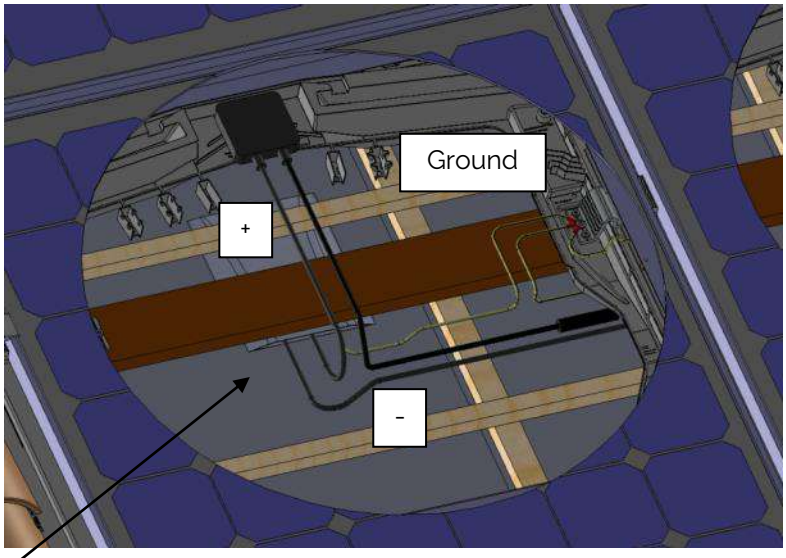
- Connect the last module.



Annex n° 5 Connection of the PV cables and grounding

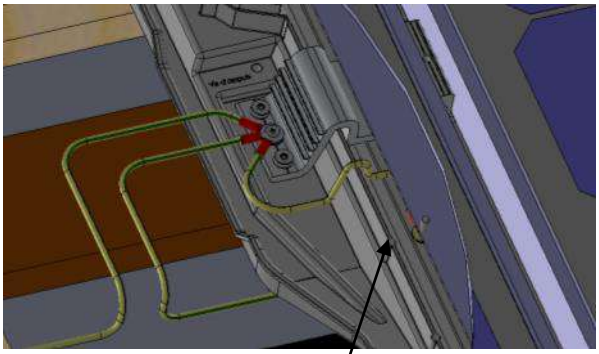
3. Ground wire into the module frame and the self-taping screw into the bracket
Wiring without loop





Cables between 2 layers (+ / - nad ground)

Cables coming from the attic between 2 layers of underlayment. The cables directions must be towards the bottom.

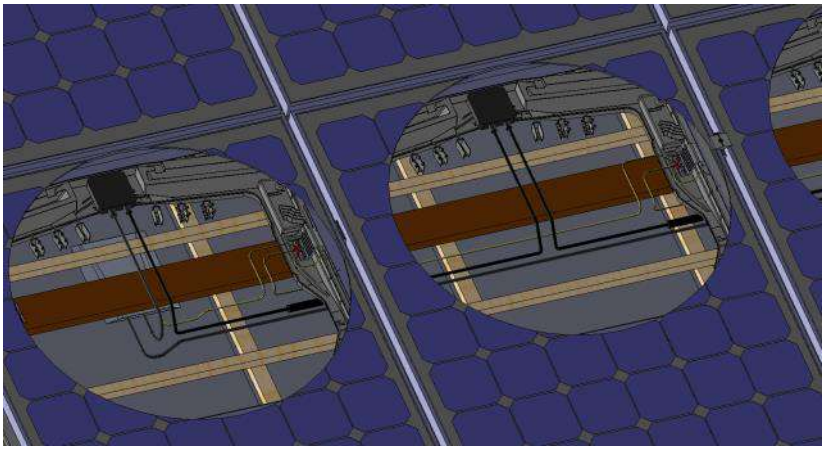


Connect the ground wire to the module's frame

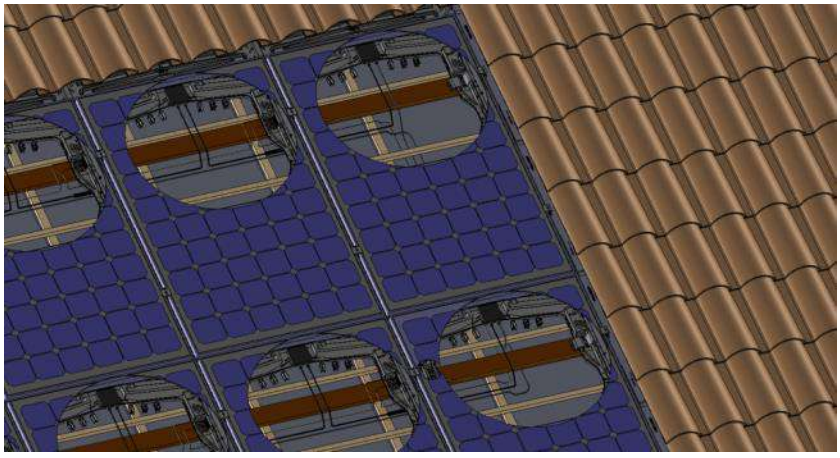
- Wire the ground every 2 brackets.
- Connect the + from the inverter to the – of the first module.

Annex n° 5 Connection of the PV cables and grounding

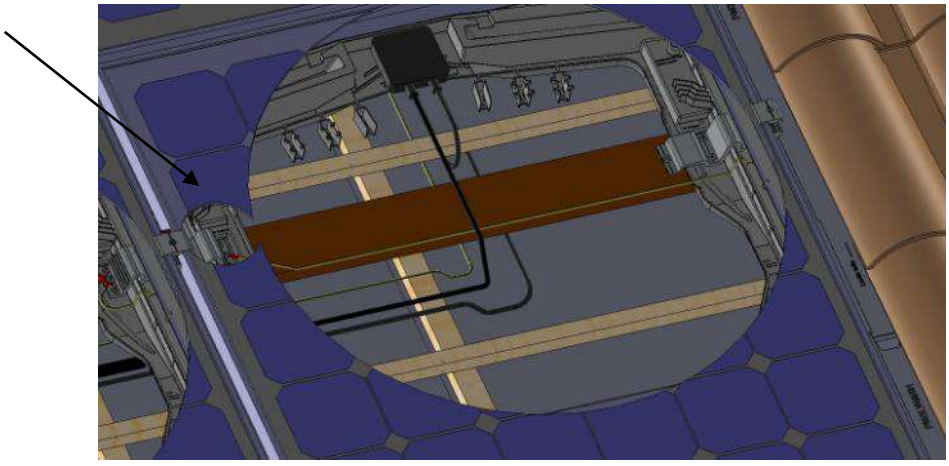
- Connect the module to each other (cable + on cable -).
- Run the – and the ground along these cables in order not do a loop.



- Go to the upper line.

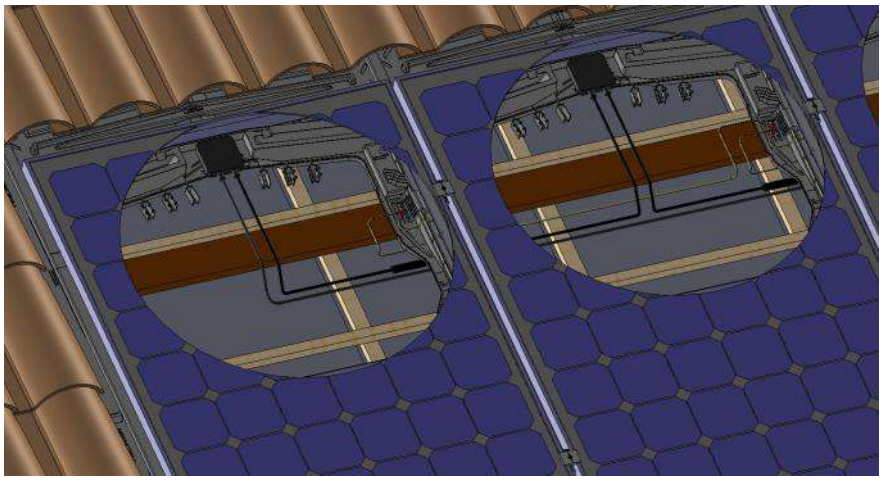


- Connect the last module of the row to the left Middle bracket



Annex n° 5 Connection of the PV cables and grounding

- Connect the last module.

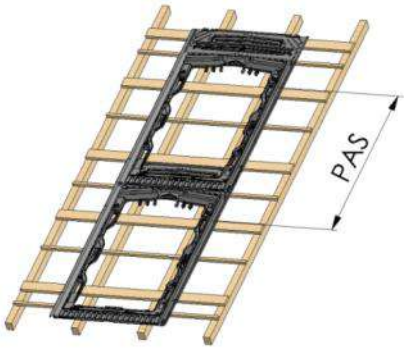


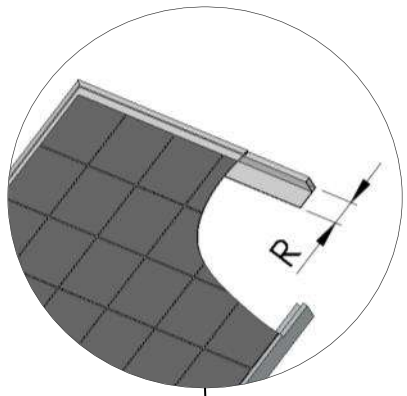
Annex n° 6 Glazing stop and deflector assembly

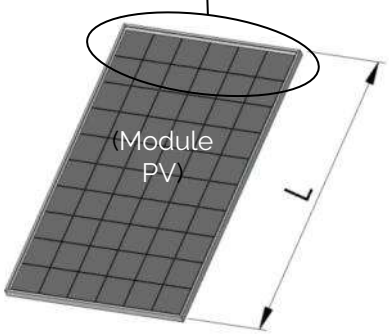
An EASY ROOF EVOLUTION L-1 installation with glazing stops MUST be equipped with blanking covers.

1. Modules compatible with glazing stop and deflector assembly

Deflector assembly is only compatible with modules that are 33 to 44mm thick. For other dimensions, please consult the manufacturer.







COMPATIBILITY

STEP	Module length (L)	R Maxi	R Mini	Assembly (1)
1655	1630	36	17	S
	1631	37	18	S
	1632	38	19	S
	1633	39	20	S
	1634	40	21	S
	1635	41	22	S
1665	1636	42	13	S
	1637	43	14	S
	1638	44	15	S
	1639	44.5	16	S
	1640	45	17	S
	1641	45.5	18	S
	1642	46	19	S
	1643	46.5	20	S
	1644	47	21	S
	1645	47.5	22	S
1675	1646	48	13	S
	1647	48.5	14	S
	1648	49	15	S
	1649	49.5	16	S
	1650	50	17	S
	1651	50	18	S
	1652	50	19	S
	1653	50	20	S
	1654	50	21	S
	1655	50	22	S
1685	1656	48	13	S
	1657	48.5	14	S
	1658	49	15	S
	1659	49.5	16	S
	1660	50	17	S
	1661	50	18	S
	1662	50	19	S
	1663	50	20	S
	1664	50	21	S
	1665	50	22	S
1695	1666	48	13	S
	1667	48.5	14	S
	1668	49	15	S
	1669	49.5	16	S
	1670	50	17	S
	1671	50	18	S
	1672	50	19	S
	1673	50	20	S
	1674	50	21	S
	1675	50	22	S
1705	1676	50	13	S
	1677	50	14	S
	1678	50	15	S
	1679	50	16	S
	1680	50	17	S
	1681	50	18	S
	1682	50	19	S
	1683	50	20	S
	1684	50	21	S
	1685	50	22	S
1715	1686	50	13	S
	1687	50	14	S
	1688	50	15	S
	1689	50	16	S
	1690	50	17	S
	1691	50	18	S
	1692	50	19	S
	1693	50	20	S
	1694	50	21	S
	1695	50	22	S
	1696	50	23	S
	1697	50	24	N
	1698	50	25	N
	1699	50	26	N
	1700	50	27	N
	1701	50	28	N
	1702	50	29	N
	1703	50	30	N
	1704	50	31	N
	1705	50	32	N

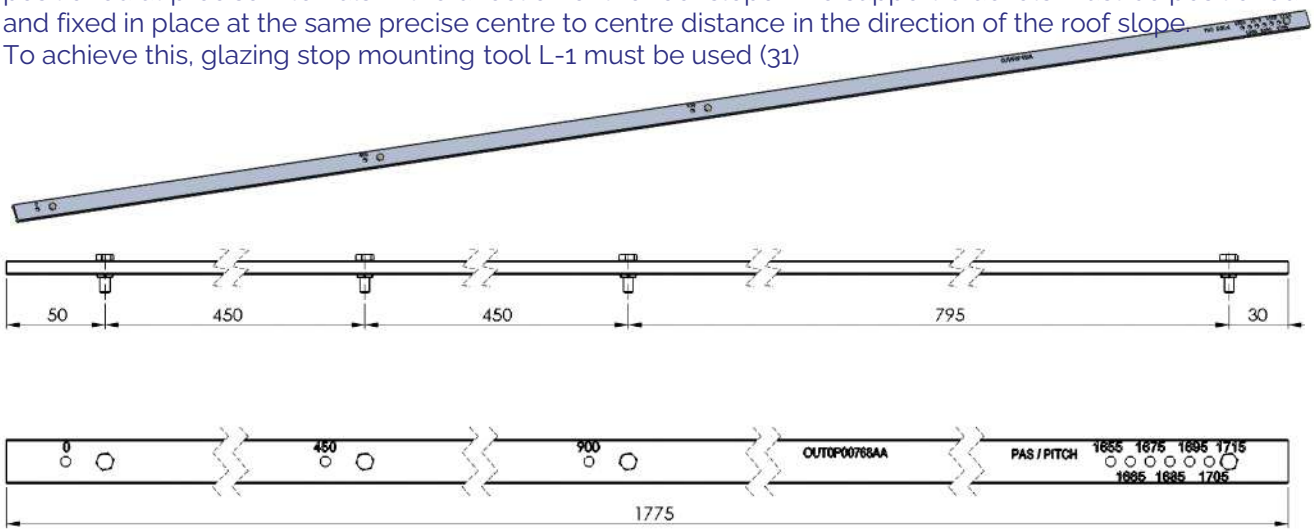
(1) Assembly :

- S - Standard, the deflectors will be put in place after the PV modules have been installed.
- N – NON standard, the deflectors must be put in place at the same time as the PV modules.

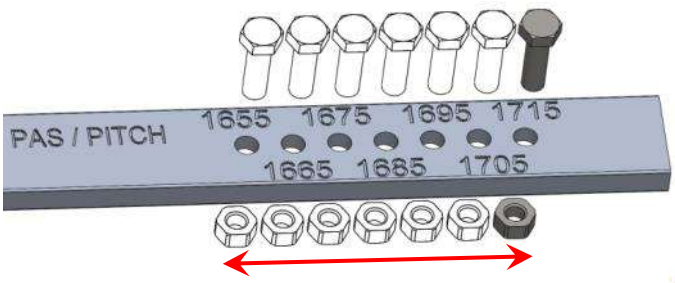
Annex n° 6 Assembly with glazing stops

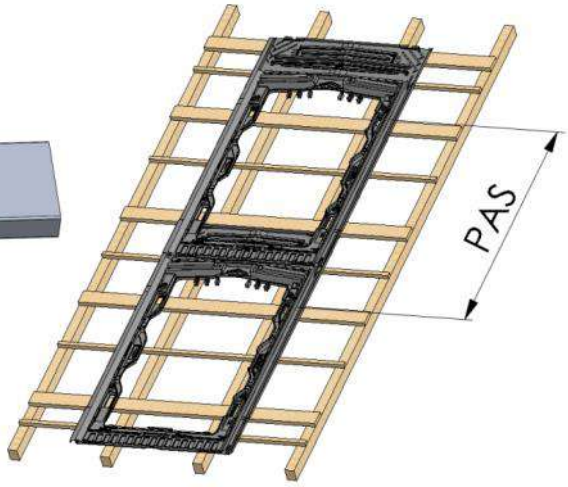
2. Preparation of the tools to be used

To install glazing stops and deflectors with the EASY ROOF O-1 system, the frames need to be positioned at precise intervals in the direction of the roof slope. The support brackets must be positioned and fixed in place at the same precise centre to centre distance in the direction of the roof slope.
To achieve this, glazing stop mounting tool L-1 must be used (31)



Unscrew the nut and put the screw in the hole corresponding to the size of the INTERVAL needed between the frames
Fully tighten the screw nut back in place.



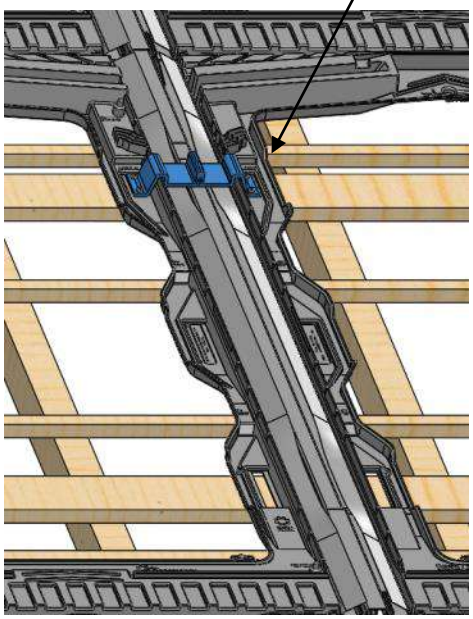


GLAZING STOP AND DEFLECTOR ASSEMBLY							
	Module length (lg)						
	≤ 1635	1636 ≤ lg ≤ 1645	1646 ≤ lg ≤ 1655	1656 ≤ lg ≤ 1665	1666 ≤ lg ≤ 1680	1681 ≤ lg ≤ 1685	1686 ≤ lg ≤ 1705
System Vertical pitch	1655	1665	1675	1685	1695	1705	1715
WARNING: check compatibility page 75 or on www.irfts.com							

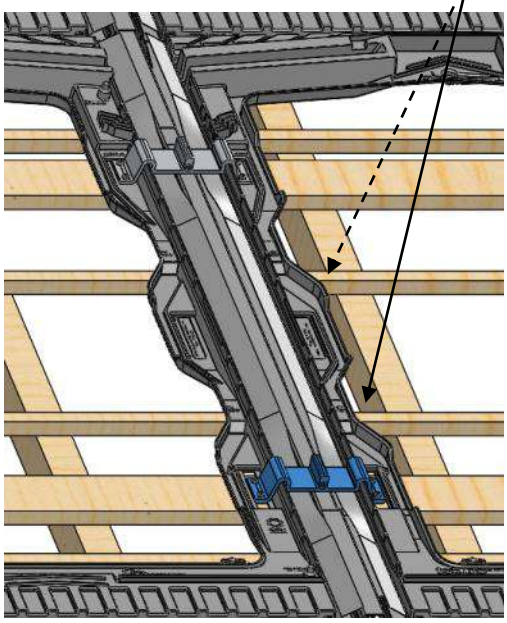
Annex n° 6 Assembly with glazing stops

3. Double bracket assembly

a) Position and screw in place the upper double bracket



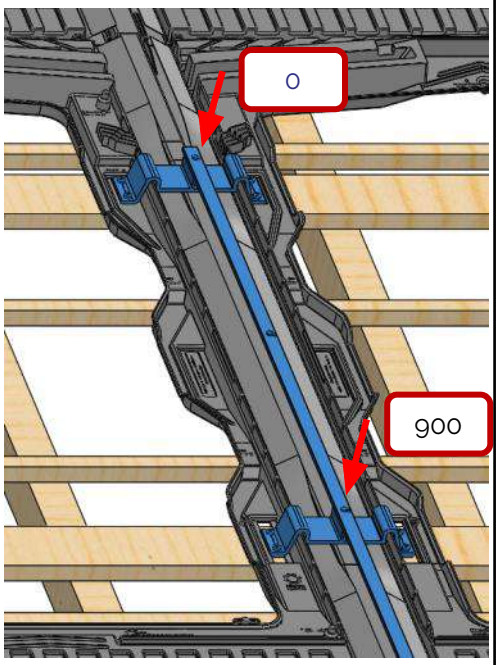
b) Position the lower double bracket (and central for a 6 bracket assembly) in its/their place(s)



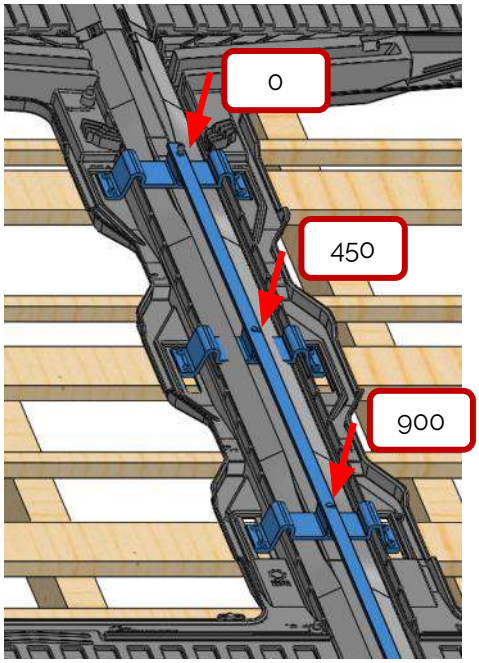
c) Put in place the glazing stop mounting tool L-1 in the (Ø6) holes of each support bracket

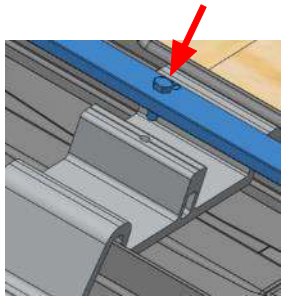
d) Screw the double bracket(s) in place, remove the glazing stop mounting tool L-1. Proceed in this manner for all the lower (and central) double brackets of each frame

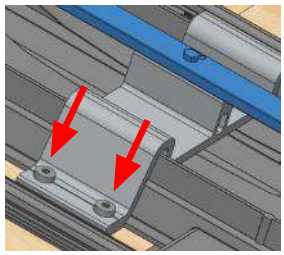
4 BRACKET ASSEMBLY



6 BRACKET ASSEMBLY





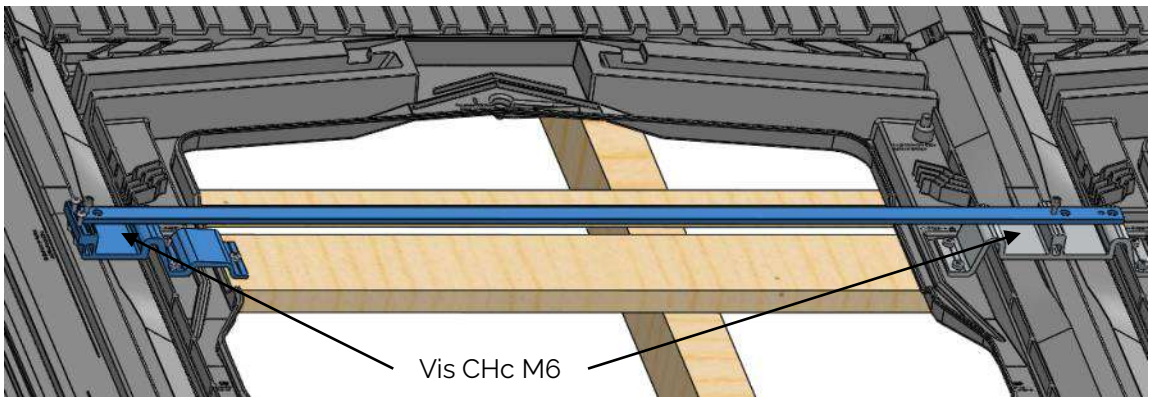


X = Graduations on the tools

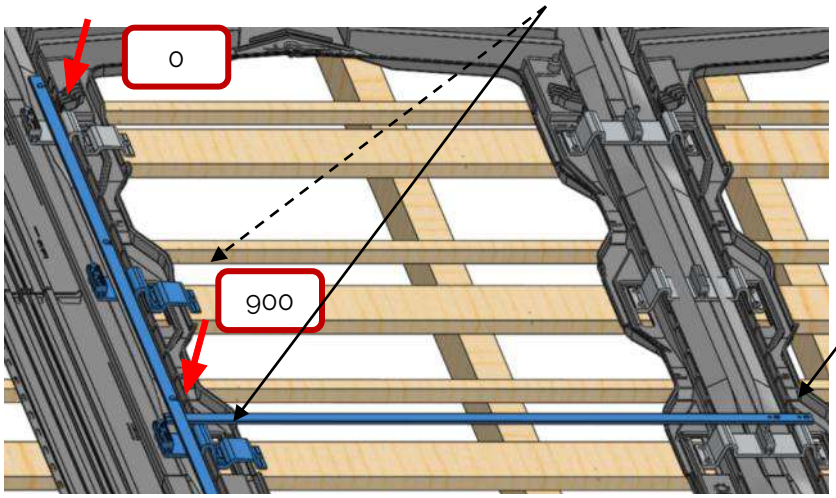
Annex n° 6 Assembly with glazing stops

4. Single bracket assembly

a) Position and screw in place the upper single bracket (see page 44)



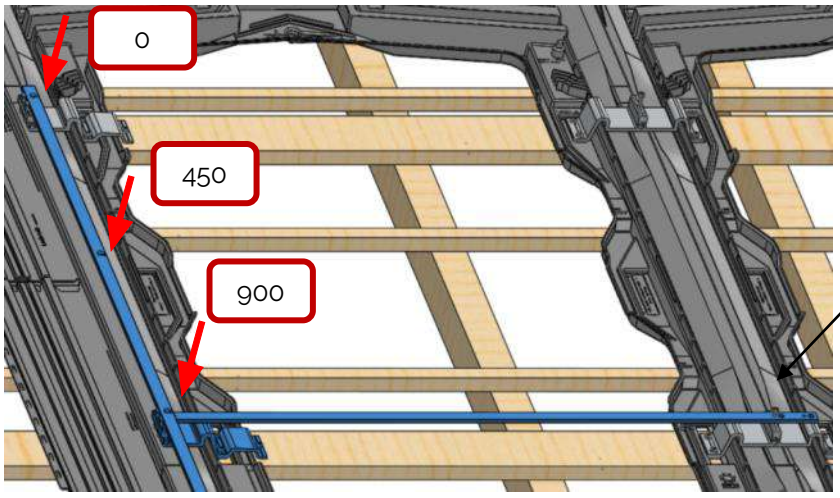
b) Position the lower single bracket (and the central one for a 6 bracket assembly) in its place
c) Put in place the horizontal assembly tool and the glazing stop assembly tool L-1 by inserting the Ø 5 screws of the assembly tool into the (Ø6) holes of each supporting bracket.



4 BRACKET ASSEMBLY

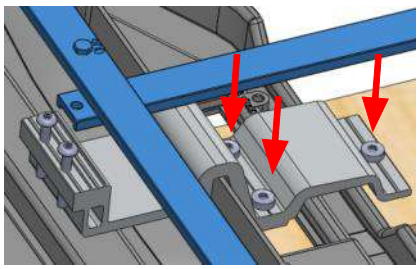
M6 CHC screw
(See page 44)

X = Graduations on the tools



6 BRACKET ASSEMBLY

M6 CHC screw
(See page 44)

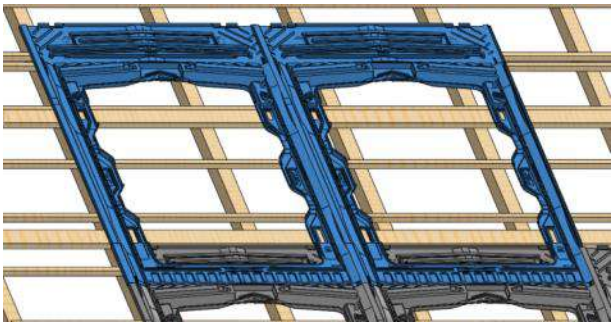


d) Screw the single bracket(s) in place, remove the mounting tools. Proceed in this manner for all the lower single brackets of each frame to the left and to the right of the PV field

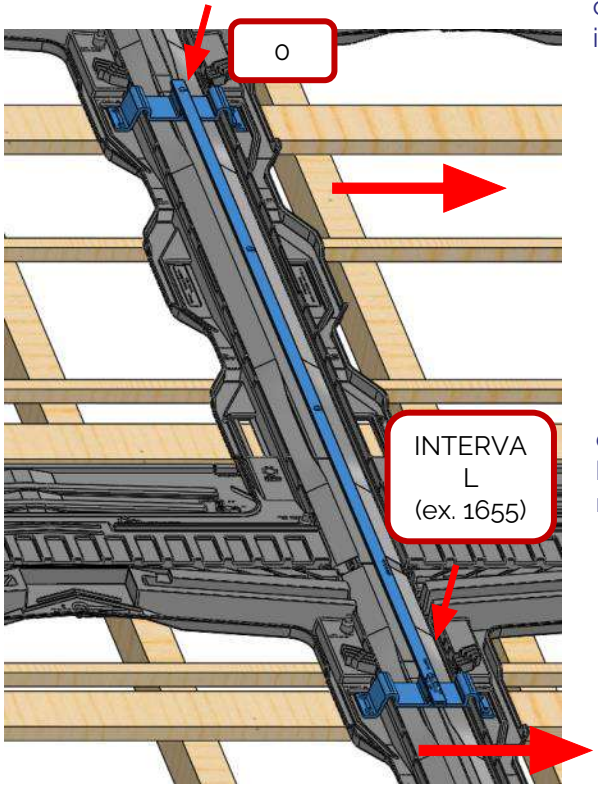
Annex n° 6 Assembly with glazing stops

5. Upper frame assembly and vertical interval adjustment

a) Position the two upper frames

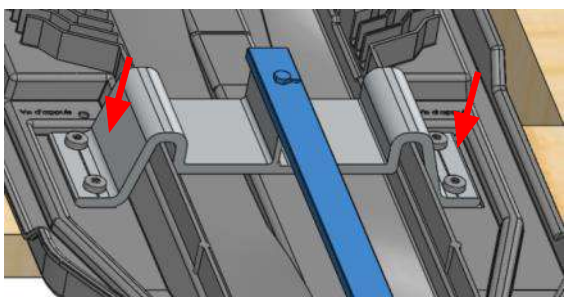


See page 75 for the definition of the right interval in accordance with the length of the module

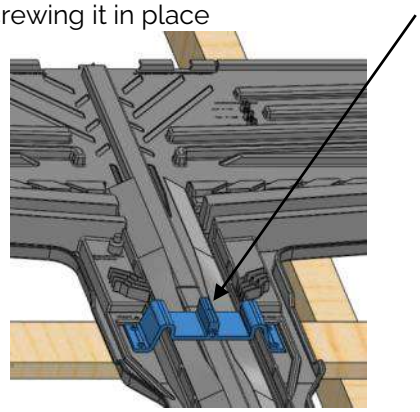


X = Graduations on the tools

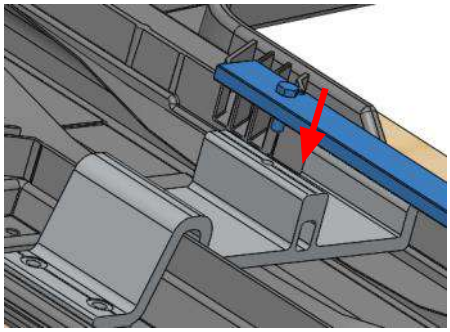
e) Screw the upper double bracket in place



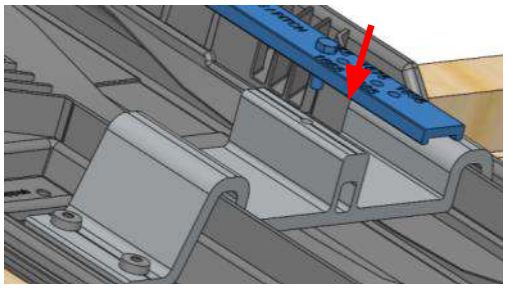
b) Position the upper double bracket without screwing it in place

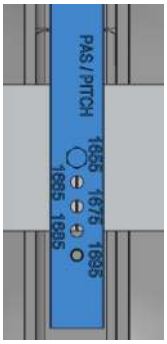


c) Put in place the glazing stop mounting tool L-1 in the (Ø6) of the upper double bracket

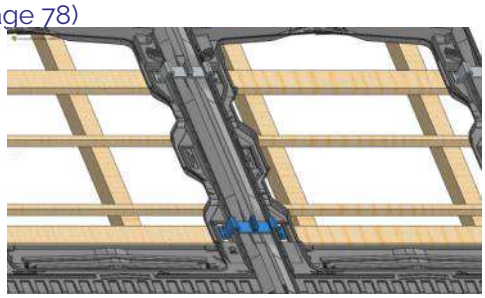


d) Put the glazing stop mounting tool L-1 in the (Ø6) hole of the lower double bracket while choosing the necessary pitch index between the frames





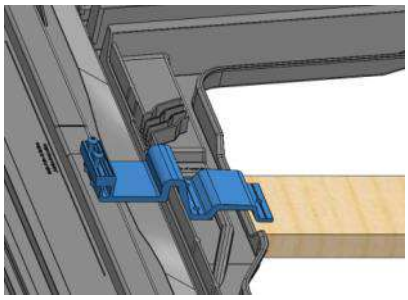
f) Put all the lower double brackets in place (and the central ones for 6 bracket assembly) for each frame (see page 78)



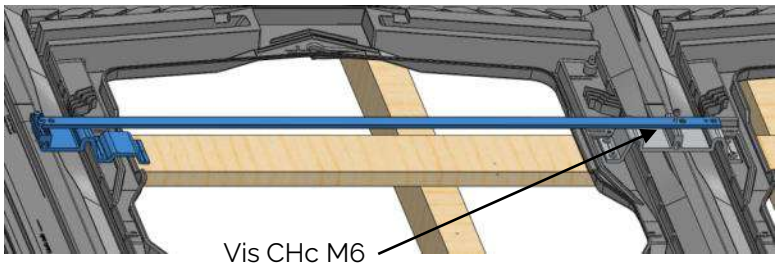
Annex n° 6 Assembly with glazing stops

5. Upper frame assembly and vertical interval adjustment

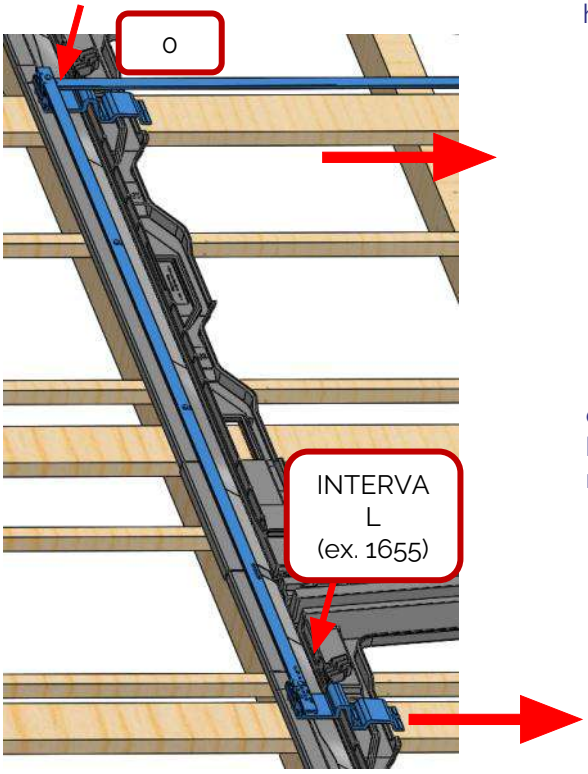
a) Position the upper single bracket without screwing it in place



b) Put in place the mounting tool L-1

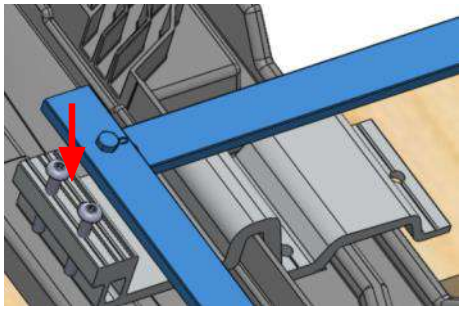


See page 73 for the definition of the right interval in accordance with the length of the module

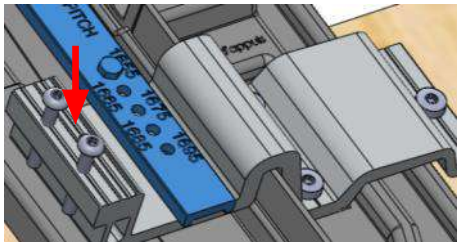


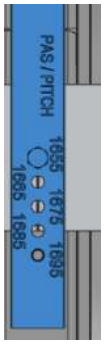
X = Graduations on the tools

c) Put the glazing stop mounting tool L-1 into the (Ø6) hole of the upper single bracket

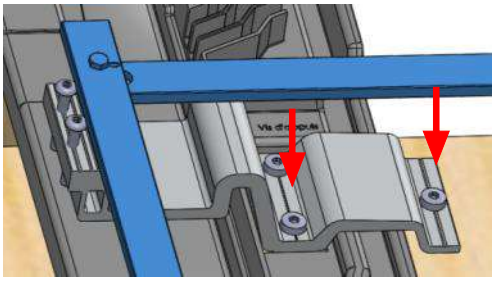


d) Put the glazing stop mounting tool L-1 in the (Ø6) hole of the lower single bracket while choosing the necessary pitch index between the frames

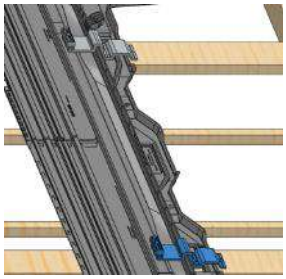




e) Screw the upper single bracket in place



f) Put all the lower single brackets in place (and central for 6 brackets) for each frame (see page 78)



Annex n° 6 Assembly with glazing stops

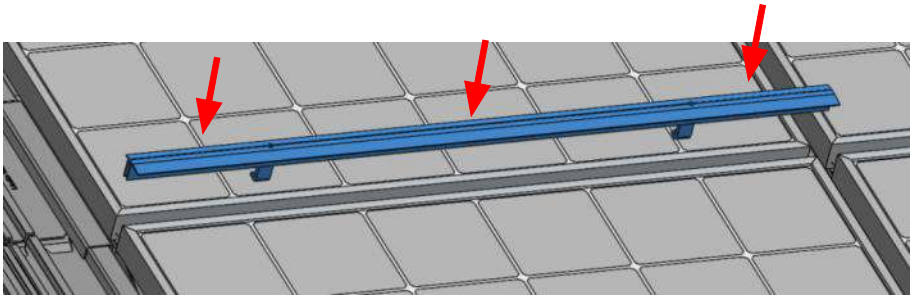
For PV fields equipped with both deflectors and glazing stops, the deflectors are to be installed first

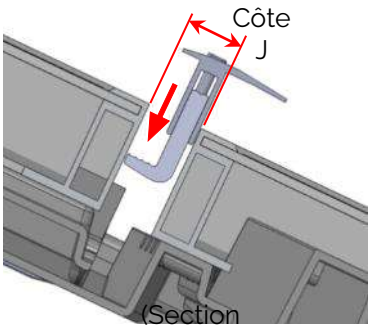
6. Deflector assembly

a) Assembly order

a1) Dimension "J" will vary according to the PV module

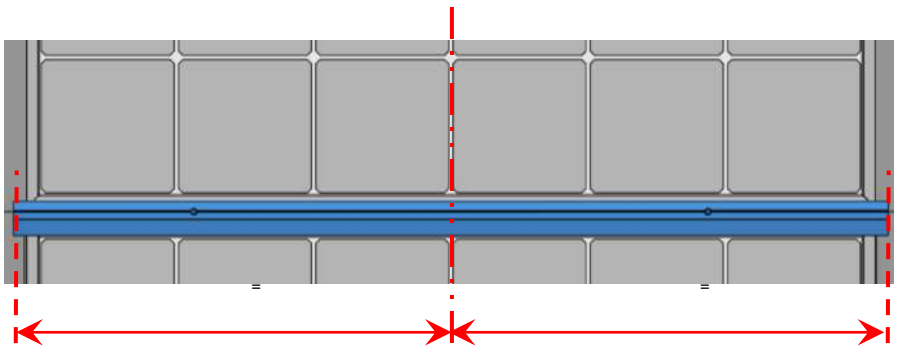
- IF "J" > 19mm: the deflectors can be installed after the PV modules have been installed
- IF "J" ≤ 19mm: the deflectors must be installed at the same time as the PV modules



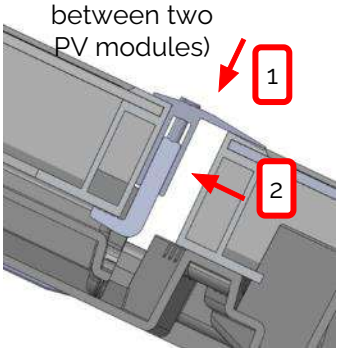


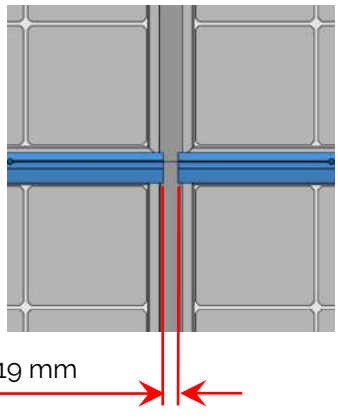
(Section drawing between two PV modules)

a2) Before tightening, flatten the deflector against the upper module and centre it on the width of the module



(Section drawing between two PV modules)





THE DEFLECTORS WILL BE CLAMPED AFTER THE GLAZING STOPS HAVE BEEN INSTALLED AND CLAMPED (for clamping see page 82)

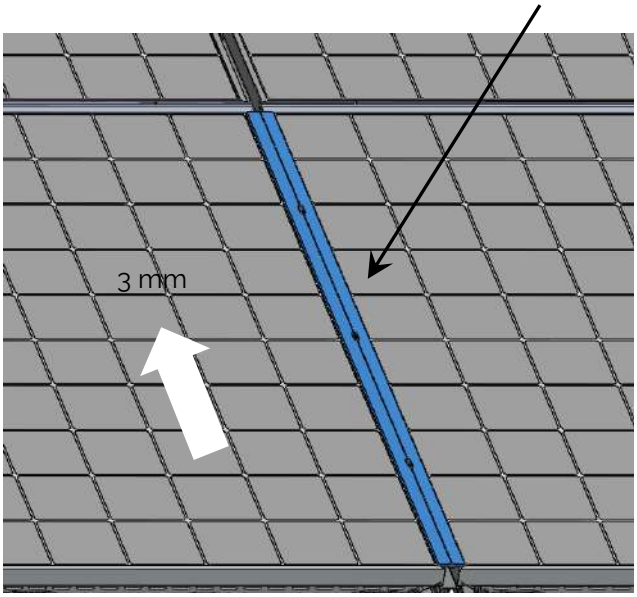
Annex n° 6 Assembly with glazing stops

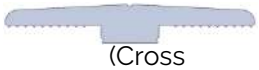
7. Assembly of the middle glazing stops

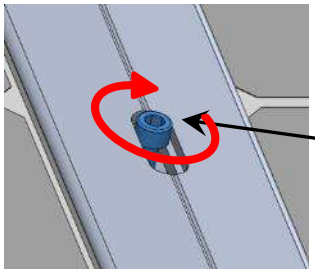
a) Position the middle glazing stops and focus of directing it to have the closest drill near to the edge.

b) Screw in place with two CHC M6 x 30 (11) or CHC M6 x 40 (10) screws depending on the thickness of the PV module (3 screws for 6 bracket assembly)

The position of the modules must comply to the requirements in the instructions page 52

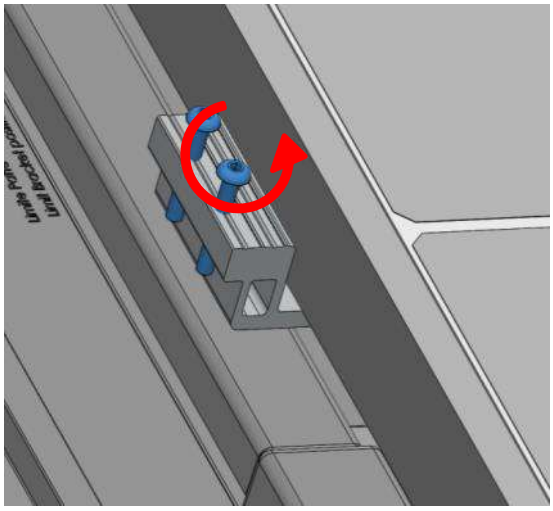


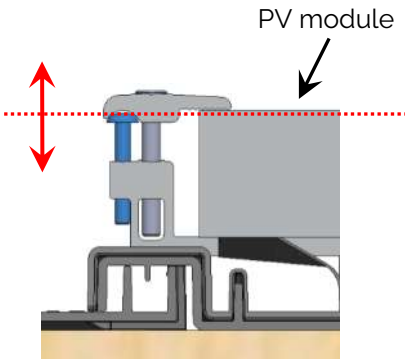

(Cross section)



8. Assembly of the side glazing stops

a) Adjust the height of the side single glazing stop support screws so that they are flush with the top of the PV module





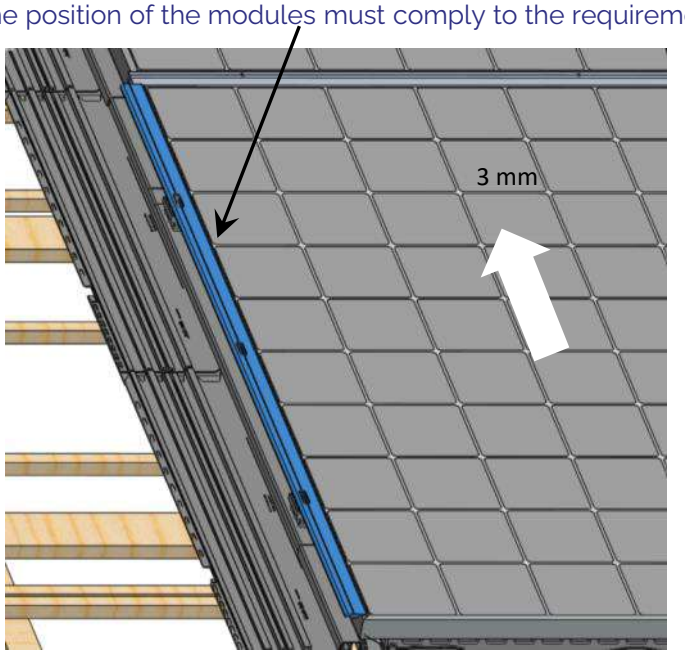
Annex n° 6 Assembly with glazing stops

8. Assembly of the side glazing stops

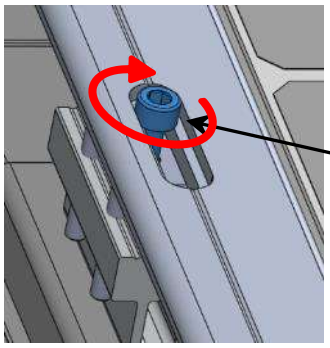
a) Position the side glazing stops

b) Screw in place with two CHC M6 x 30 (11) or CHC M6 x 40 (10) screws depending on the thickness of the PV module (3 screws for 6 bracket assembly)

The position of the modules must comply to the requirements in the instructions page 52



(Section)



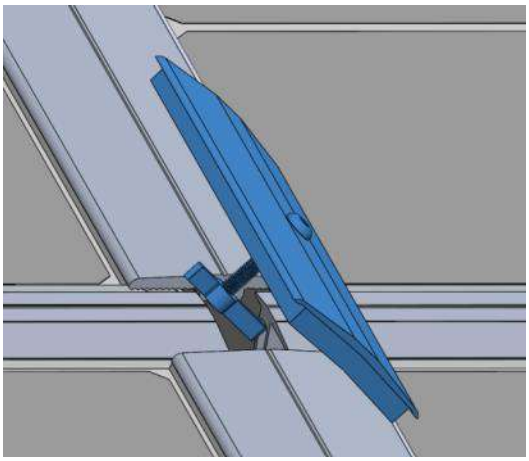
Clamping torque 8.8 Nm

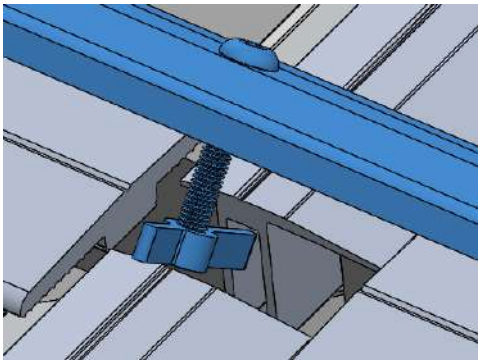
c) Screw and block in place the deflector kit screws in compliance with the instructions on page 79

9. Blanking cover assembly

a) Position the blanking covers over the gap between the glazing stops
b) Tilt them so as to be able to insert the clamping nut under the deflector

Blanking covers see page 8

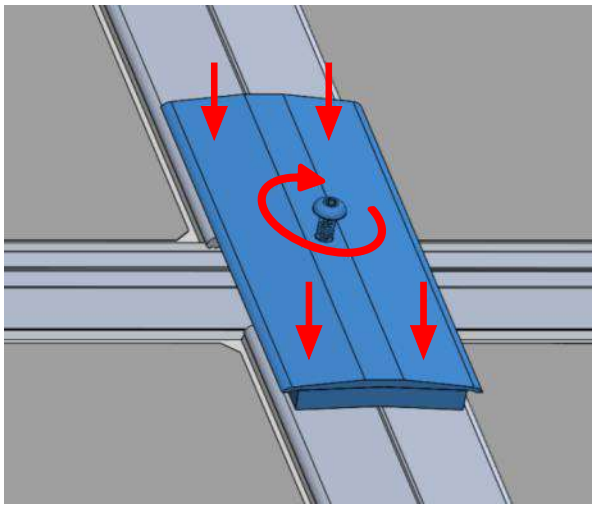


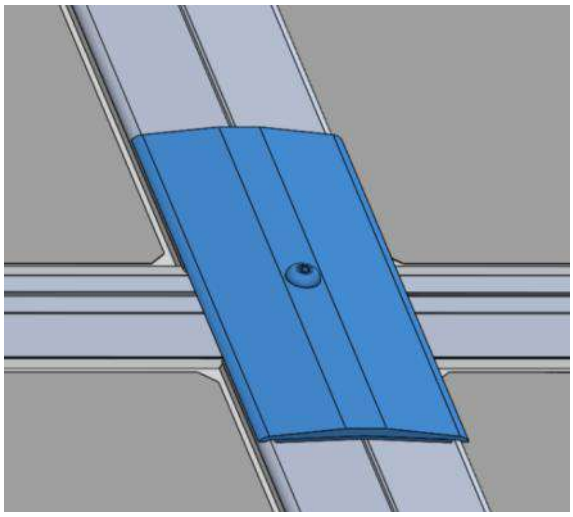


Annex n° 6 Assembly with glazing stops

9. Blanking cover assembly

c) Tighten the screw to flatten the foam and to keep it in place



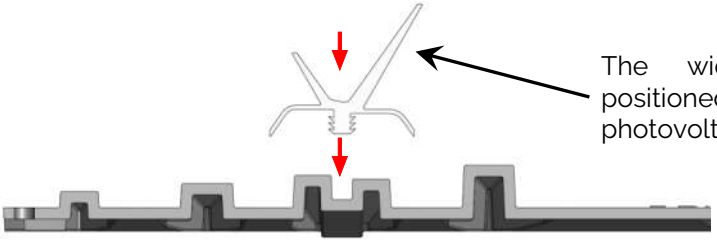


Annex n° 7 SIDE BORDER STRIP OPTION

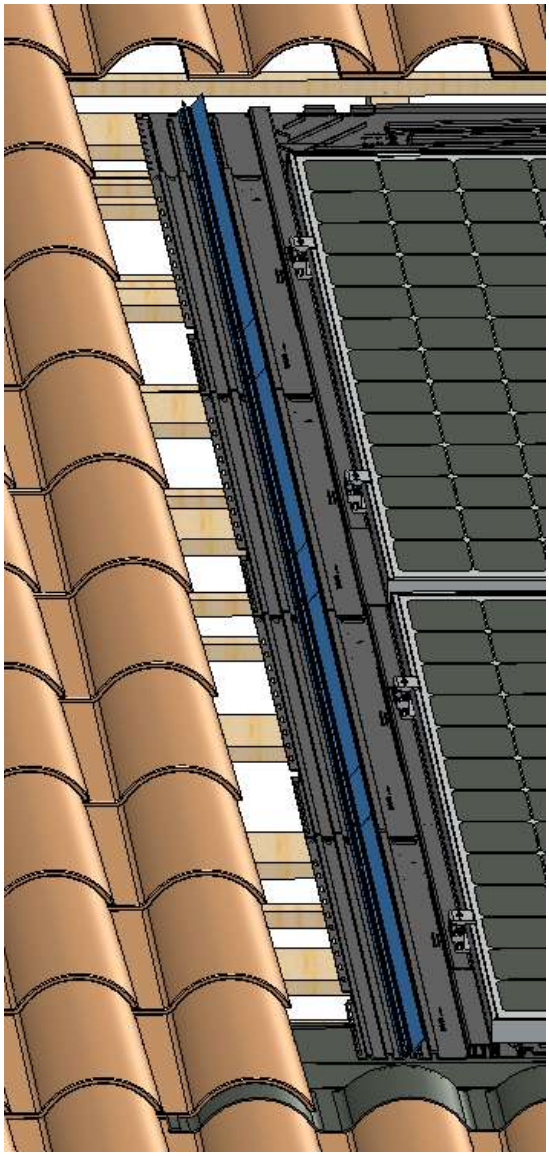
Side border strip installation

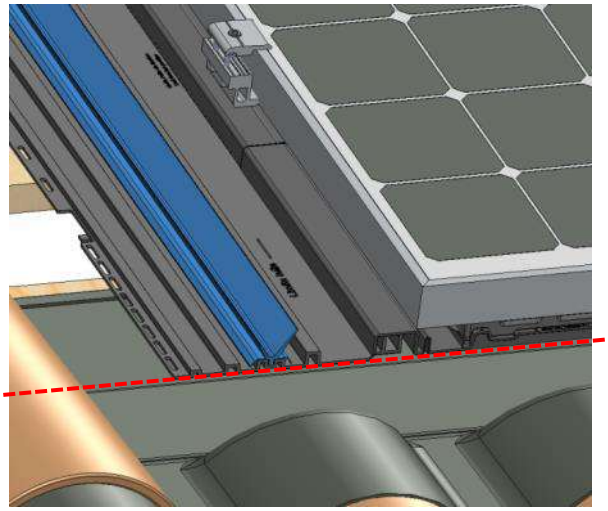
(Section)

a) Put the border strips in the grooves of the side flashing as shown below

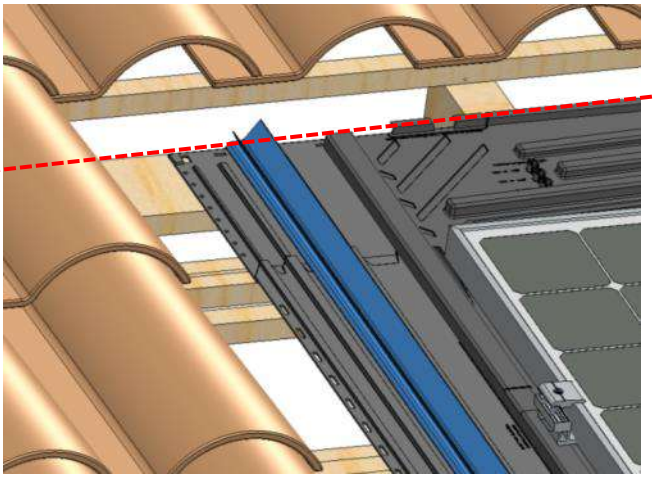


The widest lip must be positioned facing the photovoltaic field





(Bottom of the PV field)



(Bottom of the PV field)

Annex n° 8 Slate roofs Metal flashings

SOMMAIRE / SUMMARY

A **Slate on EASY ROOF EVOLUTION flashings**

A-1 PV field bottom

A-2 Side flashings

A-3 PV Field top

B **Metal flashings to be tailor made**

B-1 Side flashings

B-11 Continuous flashing

B-12 Soakers

B-2 Field top Slate roofs

B-3 Field PV top Metal flashings

C **Zinc flashings with standing seals**

C-1 Side flashings

C-2 PV Field top

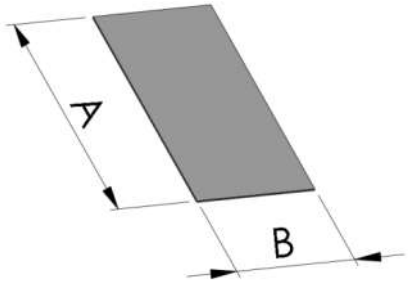
IMPORTANT It is possible to combine the different types of flashings (EASY ROOF EVOLUTION or metal), as show bellow

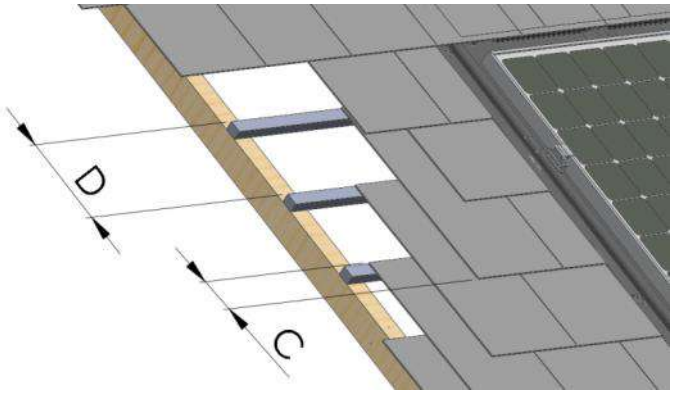
Compatibility			Flashing of PV Field top		
			EASY ROOF L-1	Metal	Zinc flashings with standing seals
Side flashing	EASY ROOF L-1		ü (A-2+A-3)		
	Metal	Continuous flashing	ü(B-11+B-2)	ü(B-11+B-3)	
		Soakers	ü(B-12+B-2)	ü(B-12+B-3)	
		Zinc flashings with standing seals			ü(C)

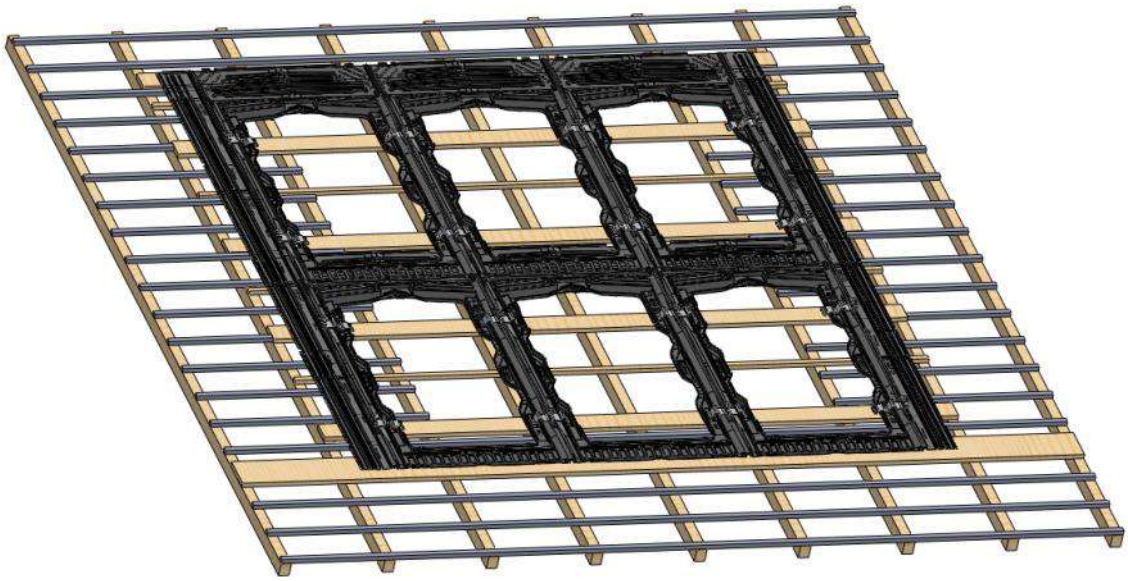
Annex n° 8

A. Slate on EASY ROOF EVOLUTION flashings

For Slate width : B≥140mm minimum





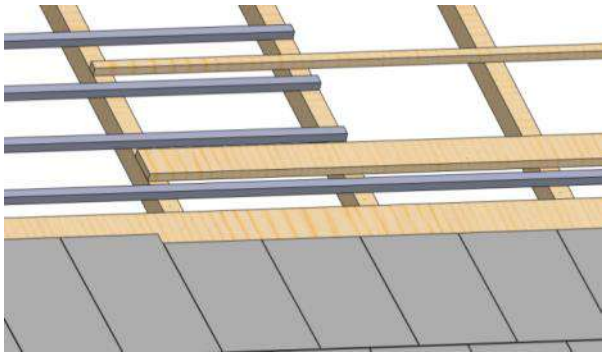


Annex n° 8

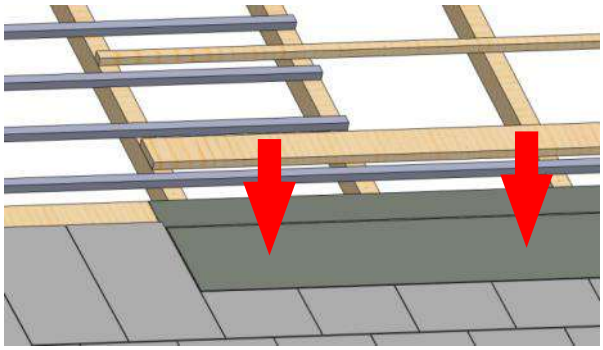
A. Slate on EASY ROOF EVOLUTION flashings

A-1 PV field bottom

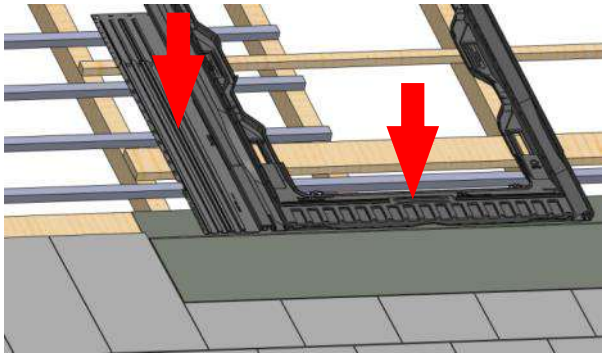
1)



2)



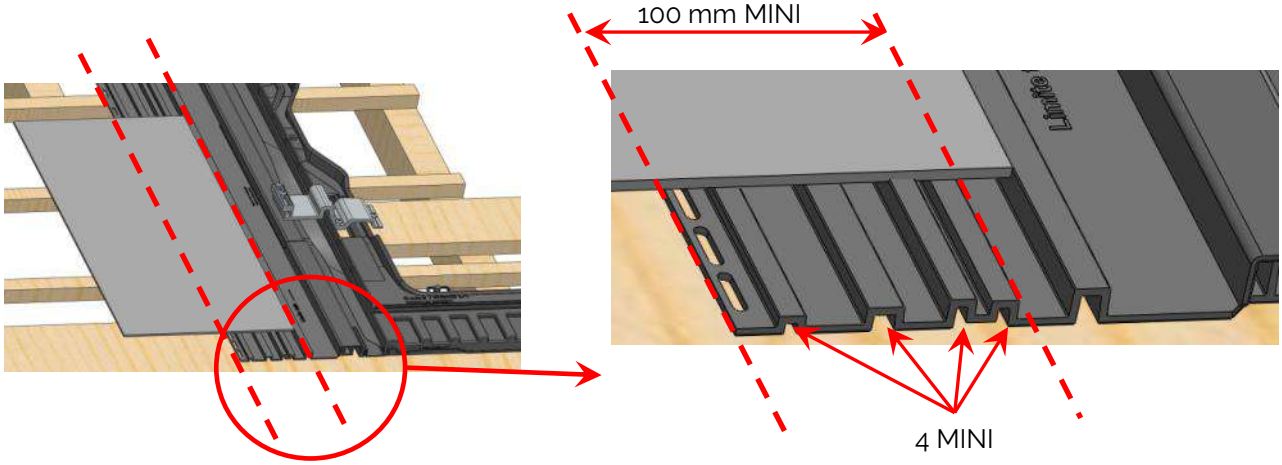
3)



(Bottom flashing)

A-2 Side flashings

1)

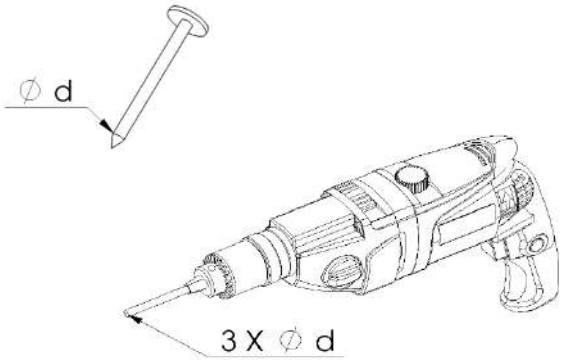


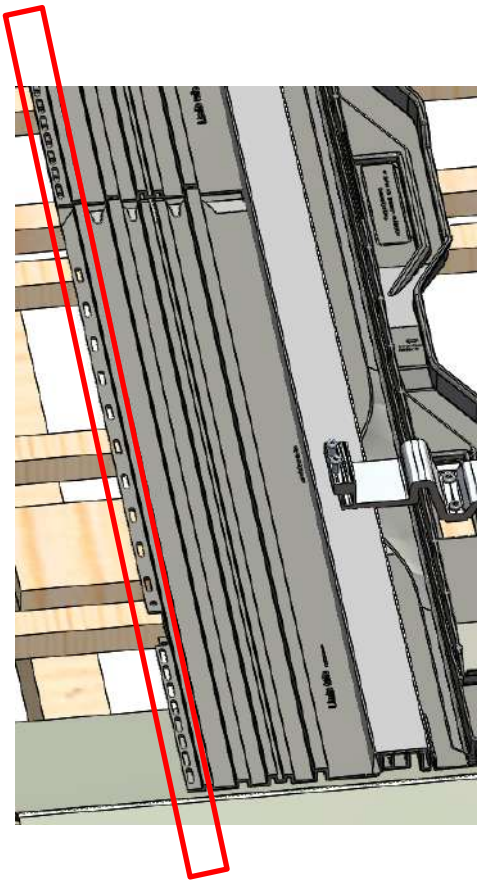
Annex n° 8

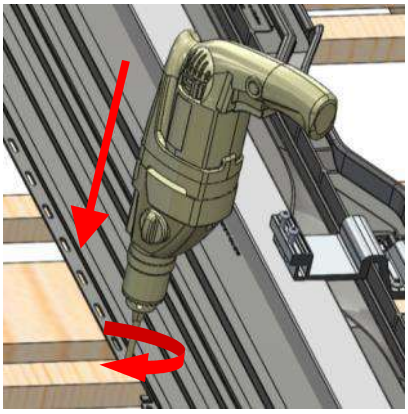
A. Slate on EASY ROOF EVOLUTION flashings

A-2 Side flashings

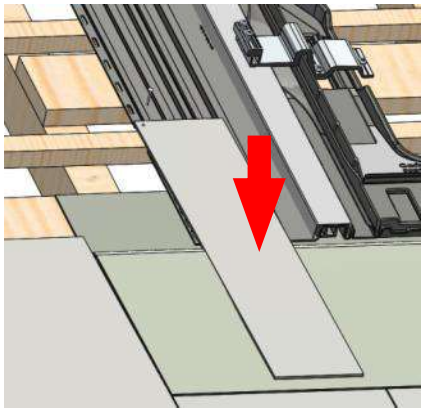
2) Authorized drilling area

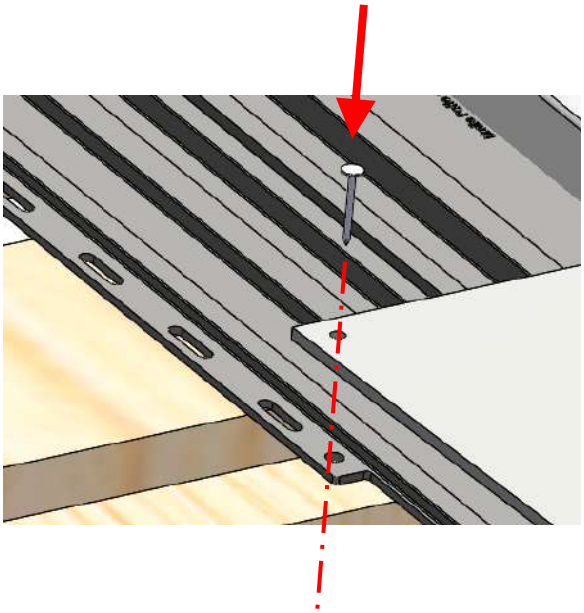






3)



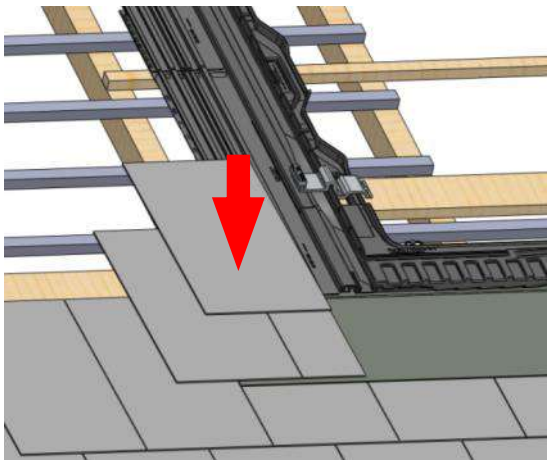


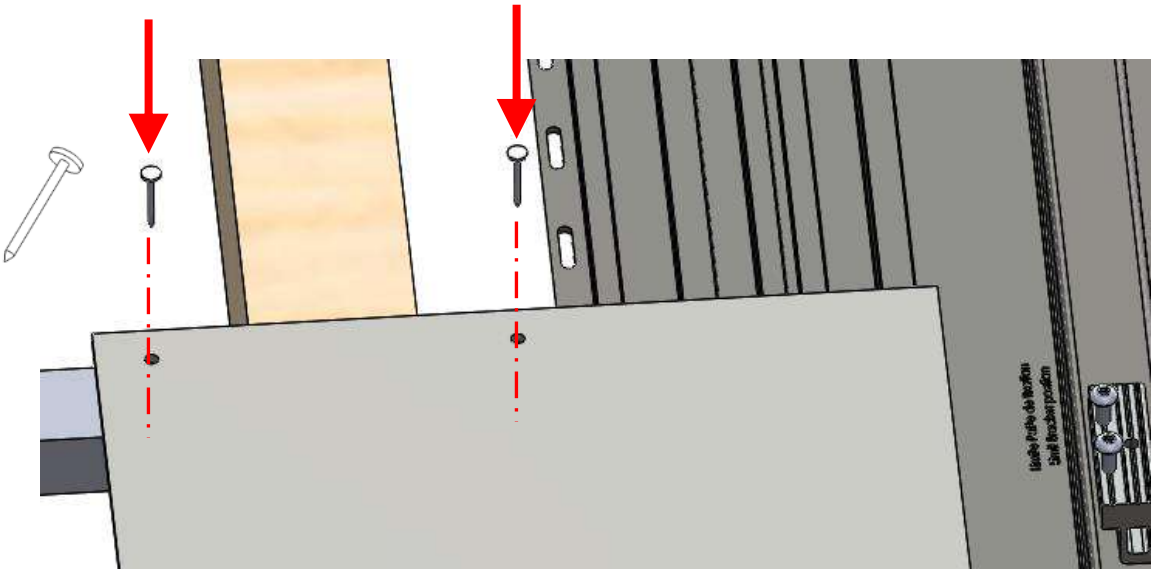
Annex n° 8

A. Slate on EASY ROOF EVOLUTION flashings

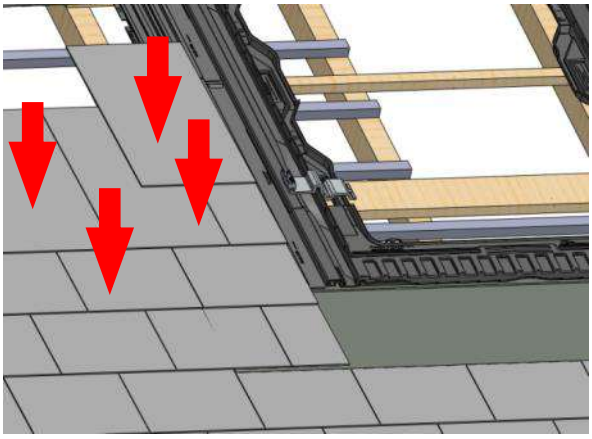
A-2 Side flashings

4)





5)

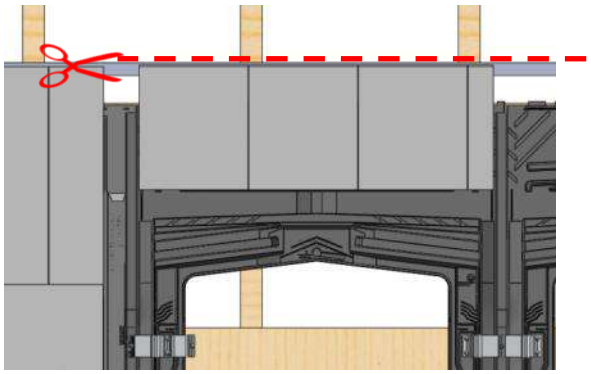


Annex n° 8

A. Slate on EASY ROOF EVOLUTION flashings

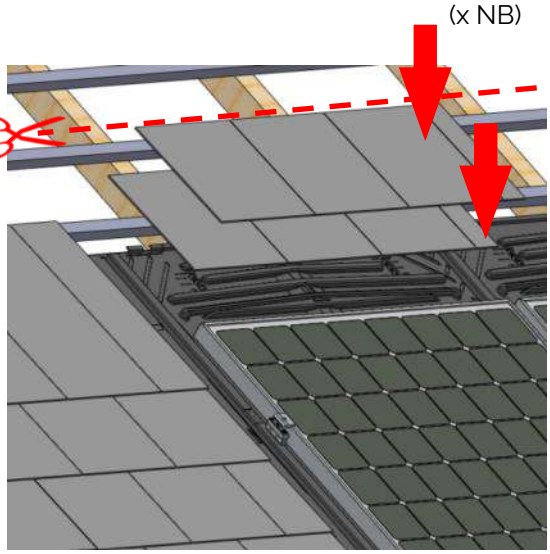
A-3 PV Field top

1)

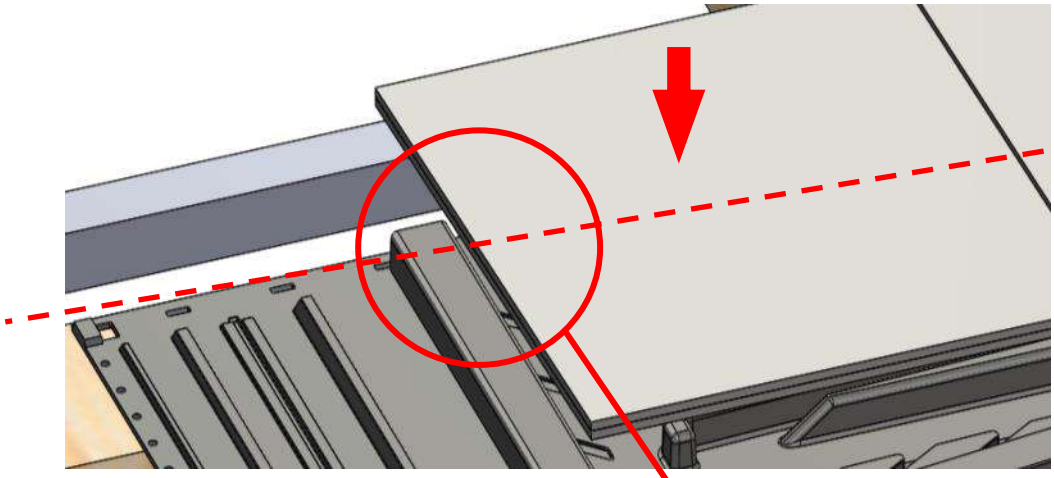


2)

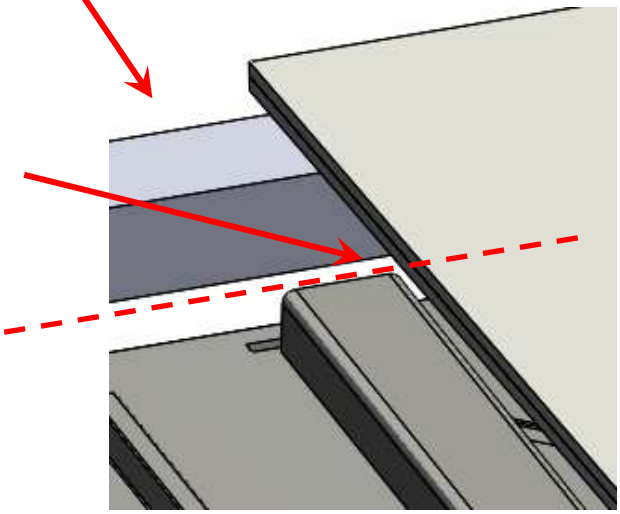
(x NB)



Overlay multiple slates (x N)



NB slate(s) = same level (height)

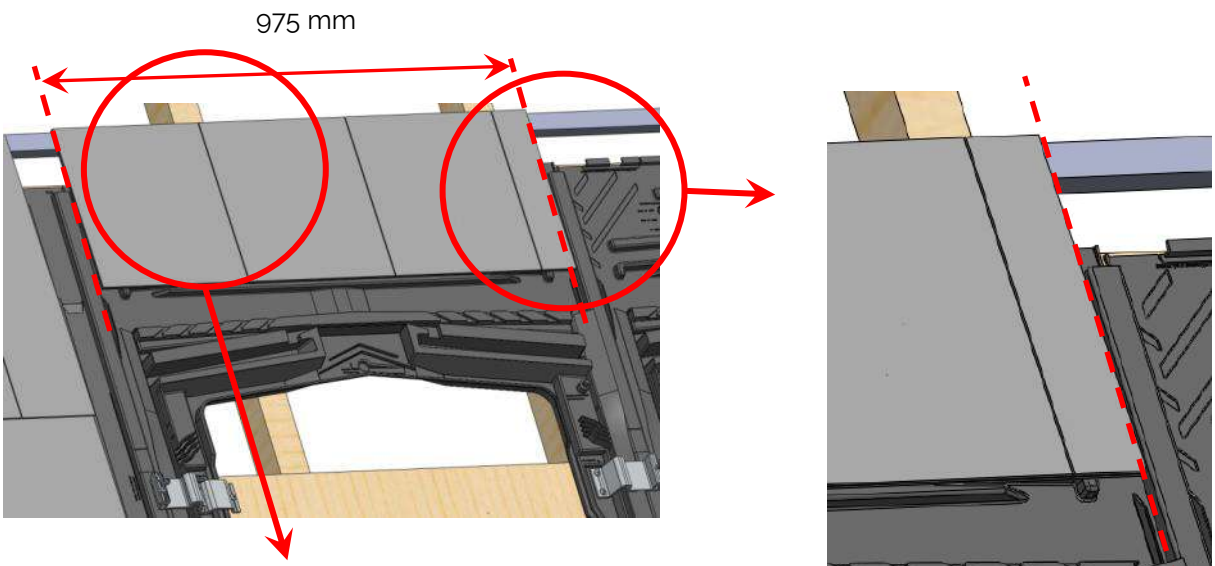


Annex n° 8

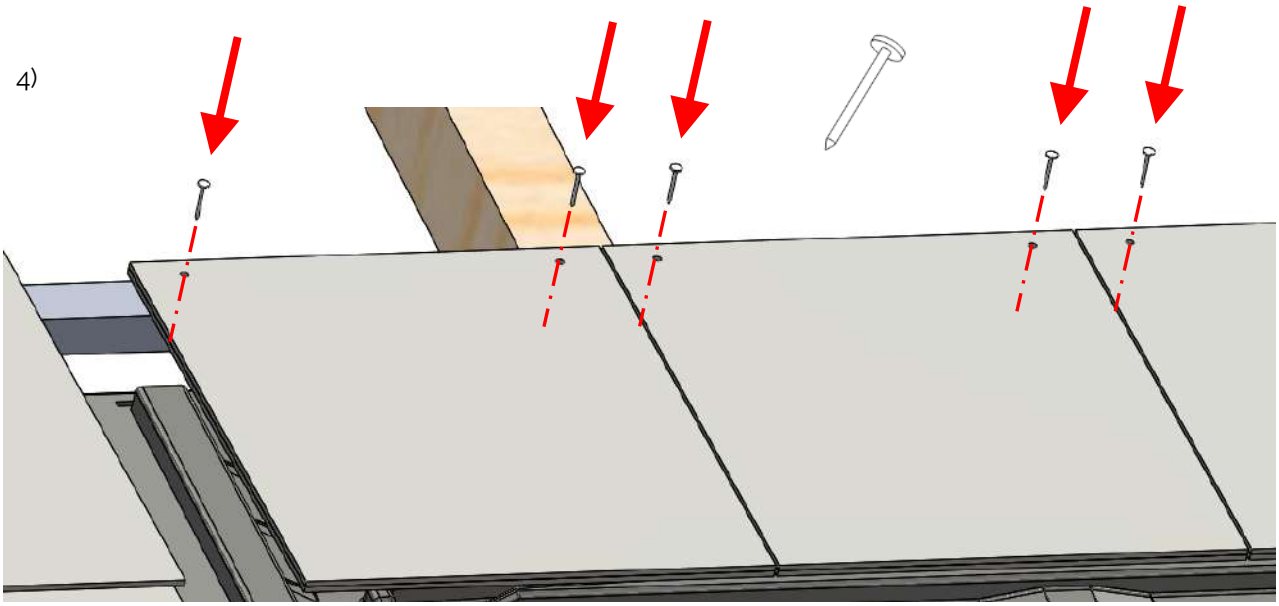
A. Slate on EASY ROOF EVOLUTION flashings

A-3 PV Field top

3)



4)

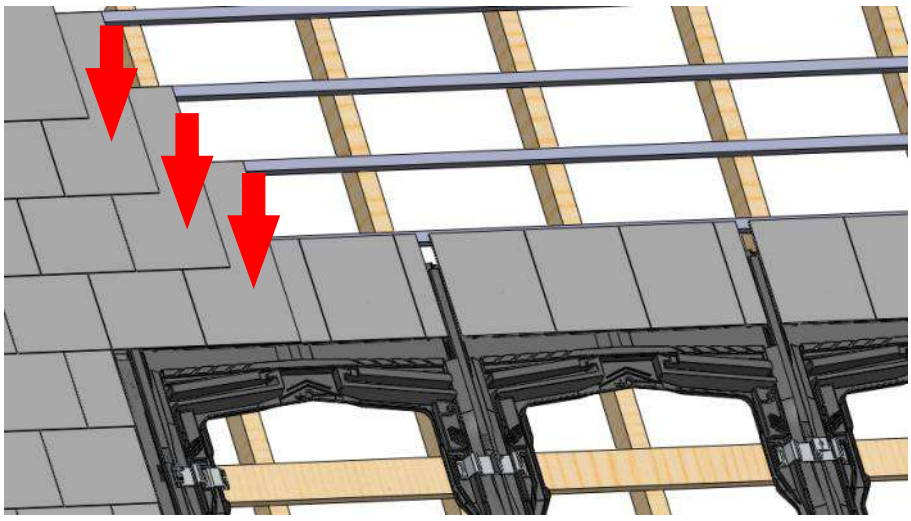


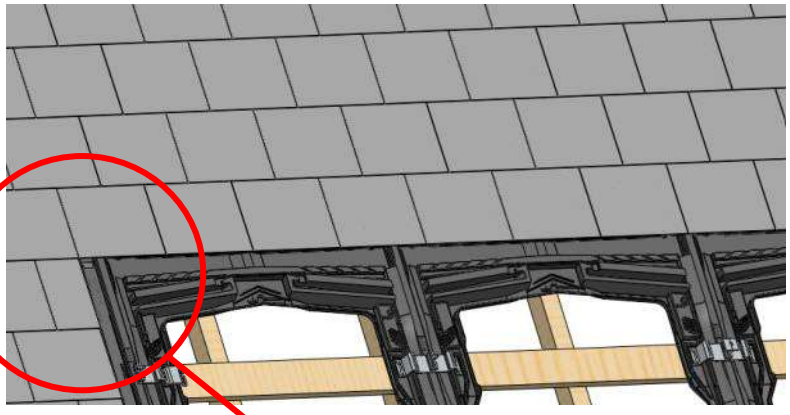
Annex n° 8

A. Slate on EASY ROOF EVOLUTION flashings

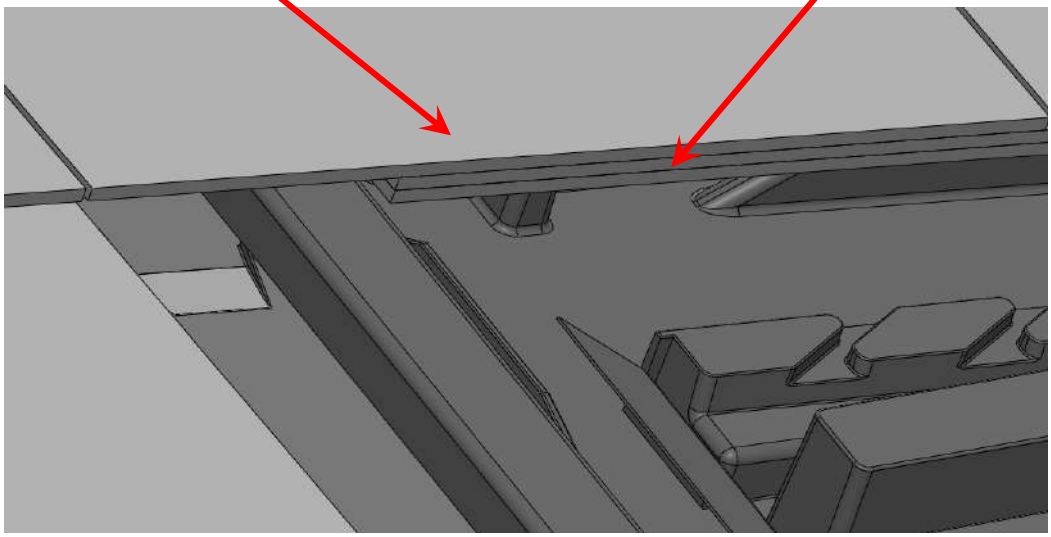
A-3 PV Field top

5)





NB slate(s)
see page 91

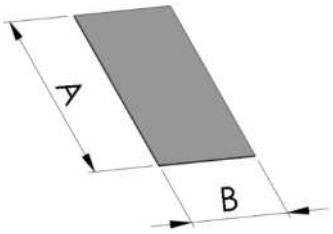


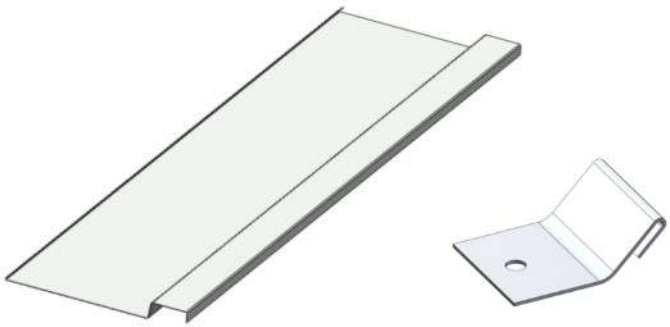
Annex n° 8

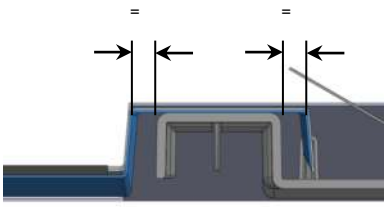
B. Metal flashings to be tailor made

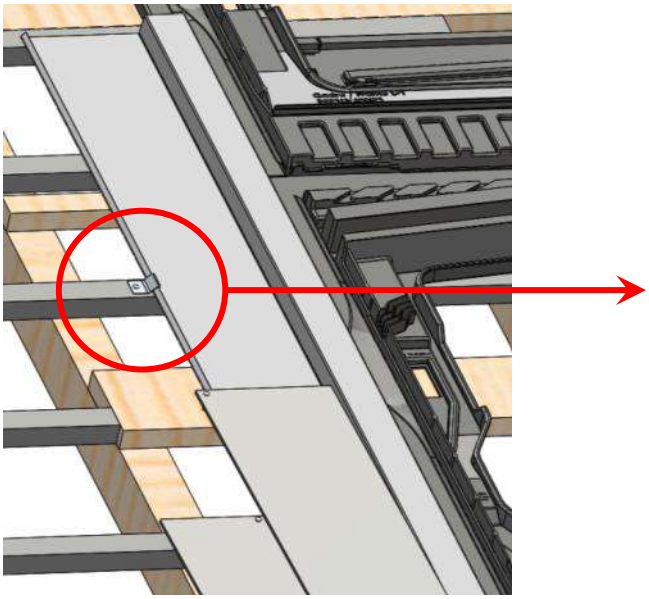
B-1 Side flashings

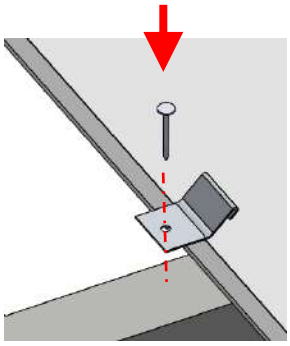
B-11 Continuous flashing

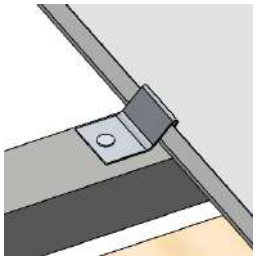










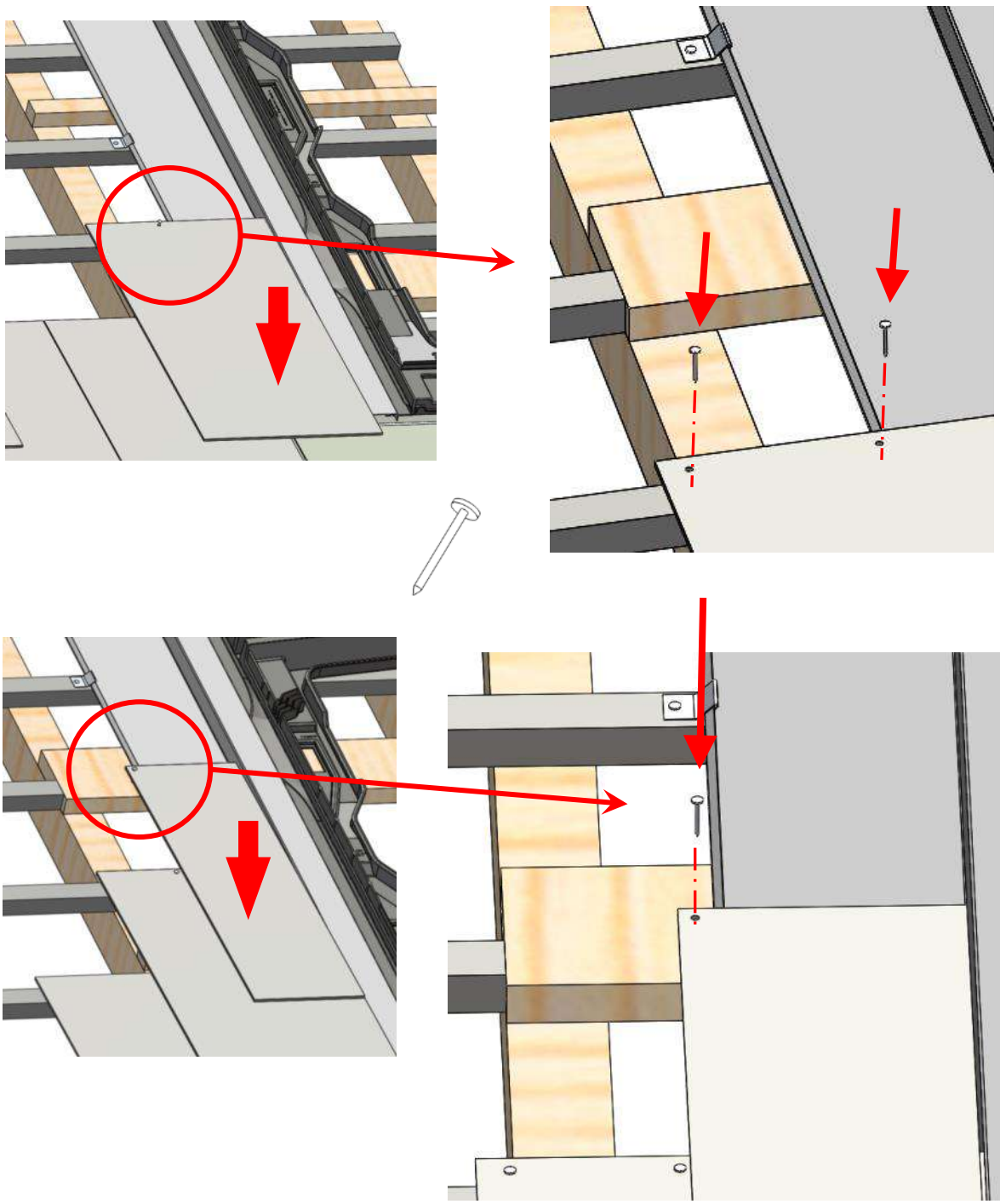


Annex n° 8

B. Metal flashings to be tailor made

B-1 Side flashings

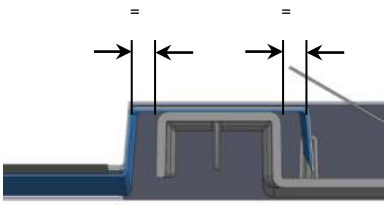
B-12 Continuous flashing



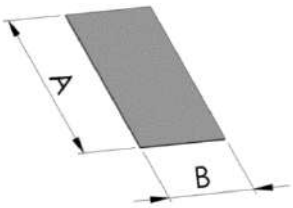
Annex n° 8

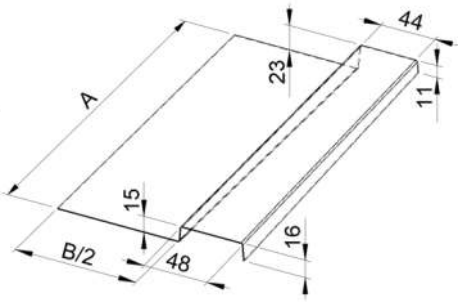
B. Metal flashings to be tailor made

B-1 Side flashings
B-12 Soakers

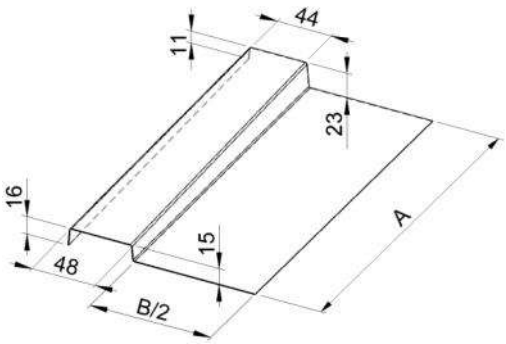


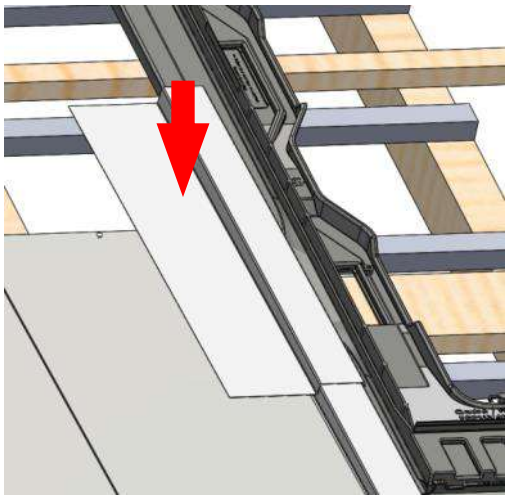
Left

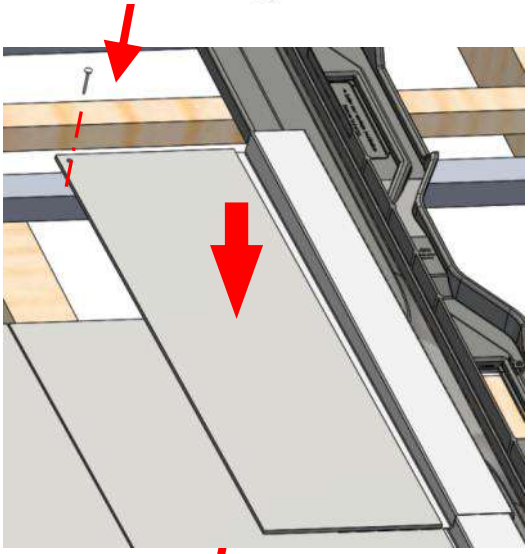


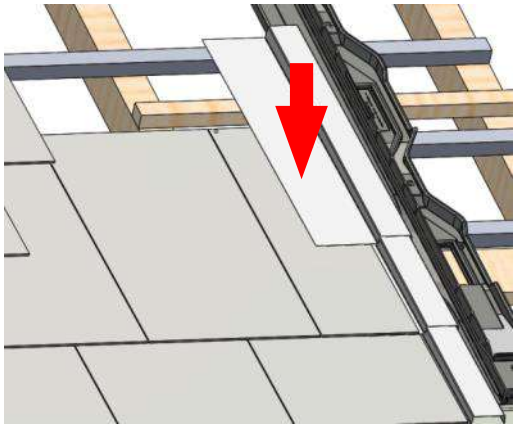


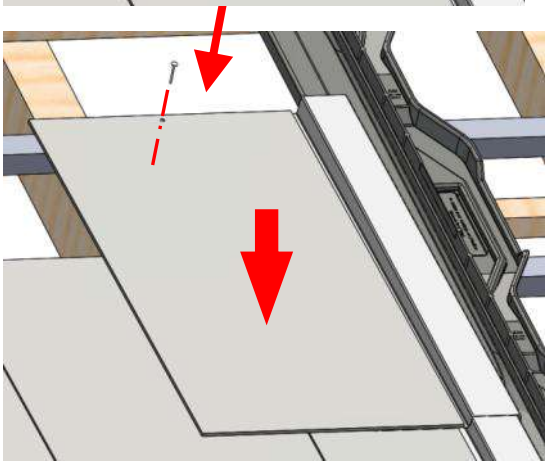
Right









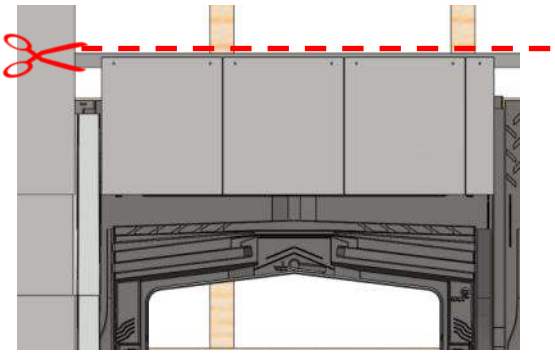


Annex n° 8

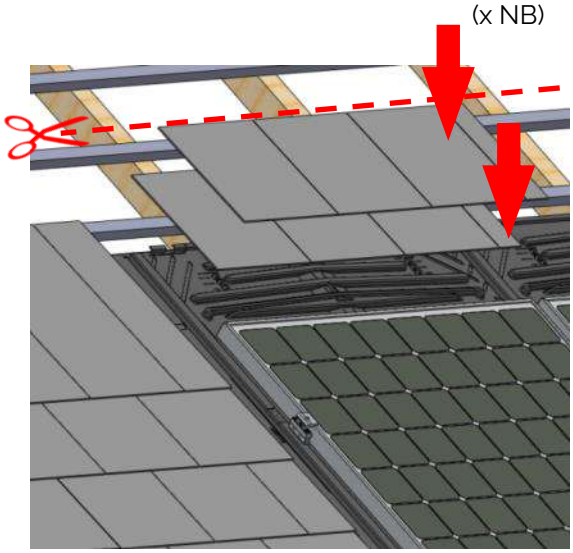
B. Metal flashings to be tailor made

B-2 PV Field top / Slate roofs

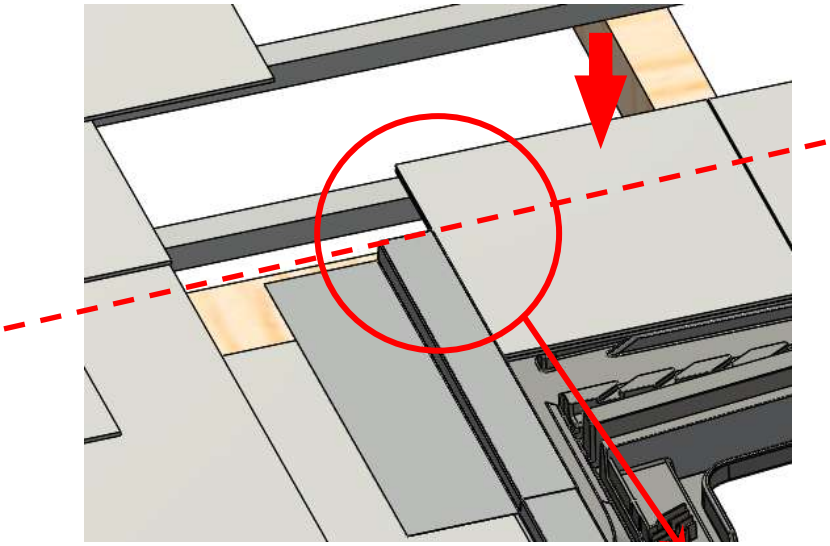
1)



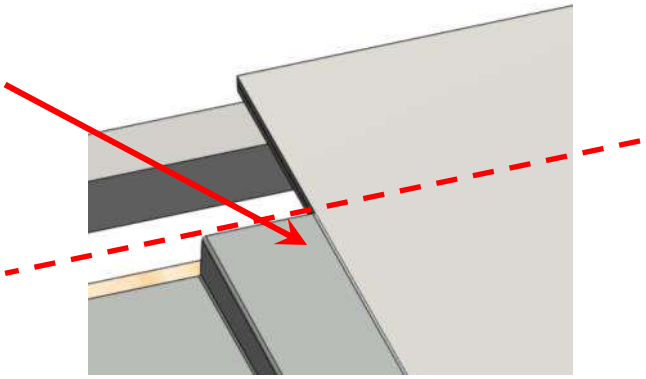
2)



Overlay multiple slates (x N)



N slate(s) = same level (height)

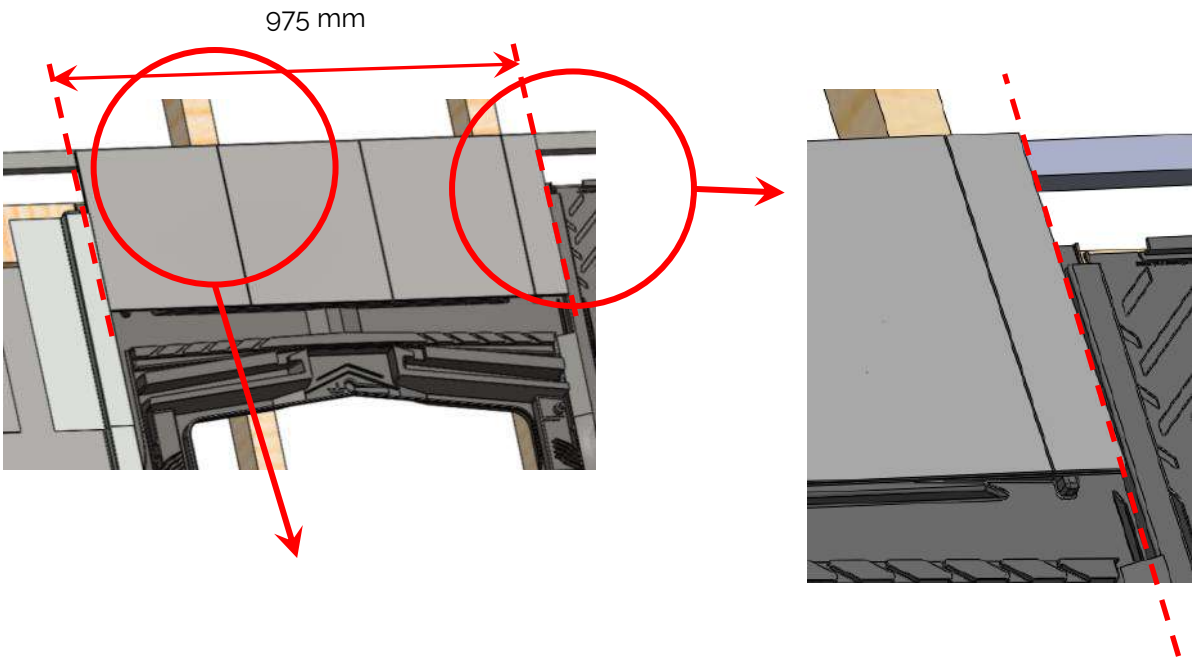


Annex n° 8

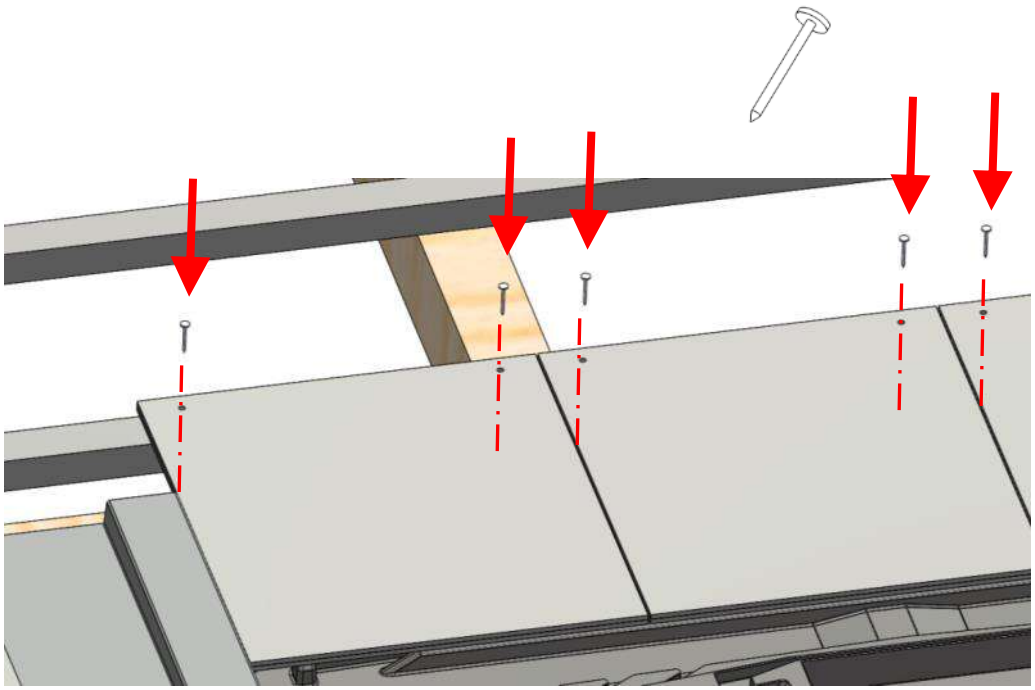
B. Metal flashings to be tailor made

B-2 PV Field top / Slate roofs

3)



4)

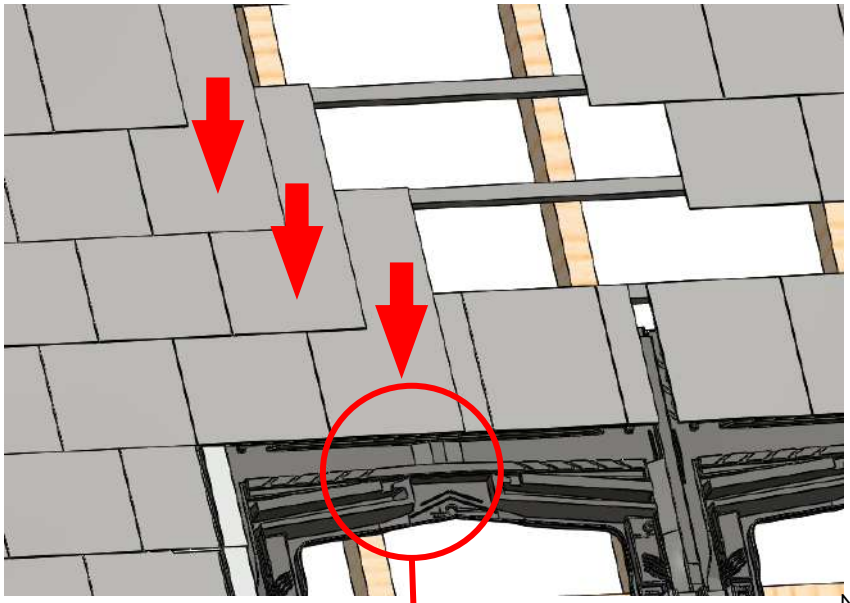


Annex n° 8

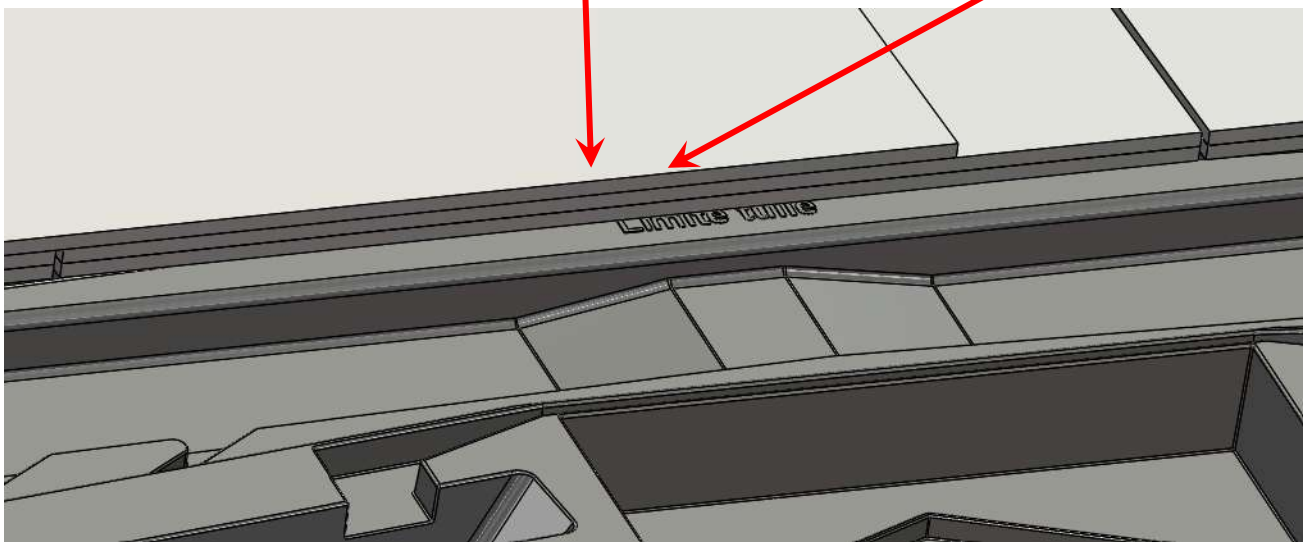
B. Metal flashings to be tailor made

B-2 PV Field top / Slate roofs

5)



NB slate(s)
see page 97

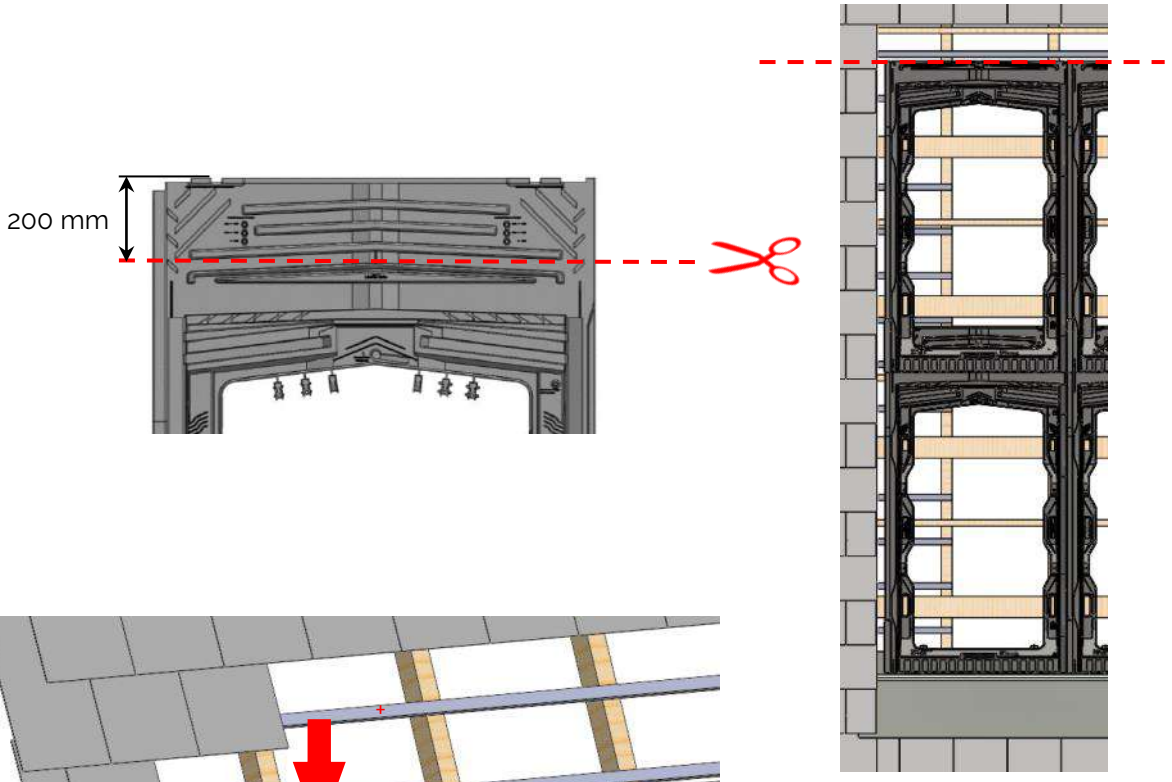


Annex n° 8

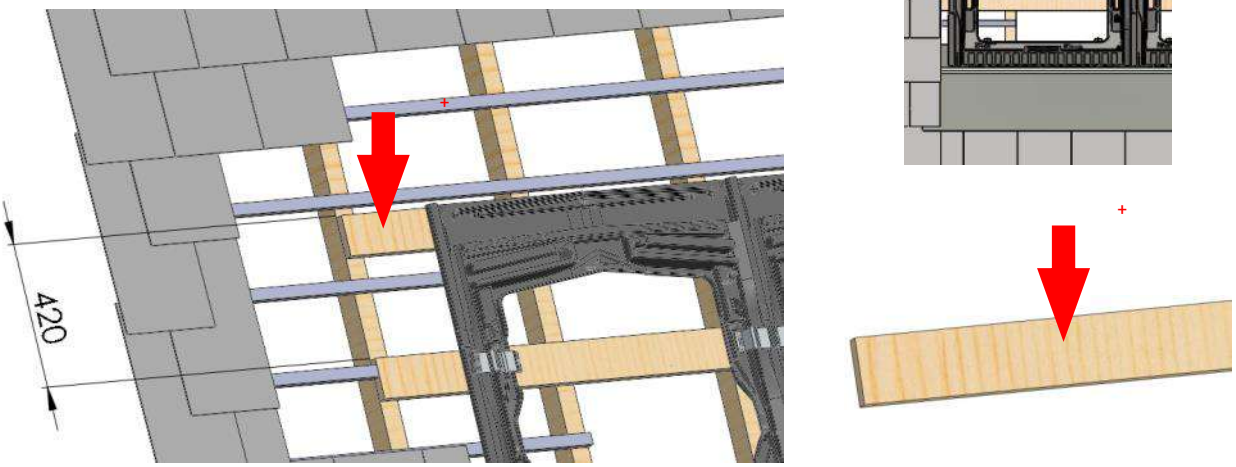
B. Metal flashings to be tailor made

B-3 Field PV top / Metal flashings

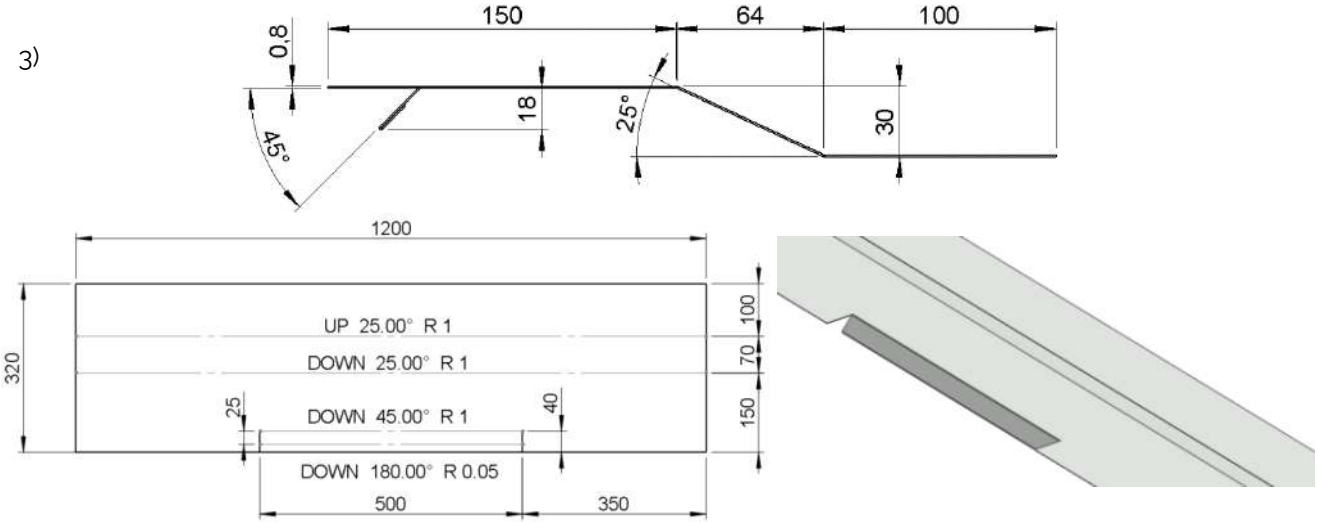
1)



2)



3)

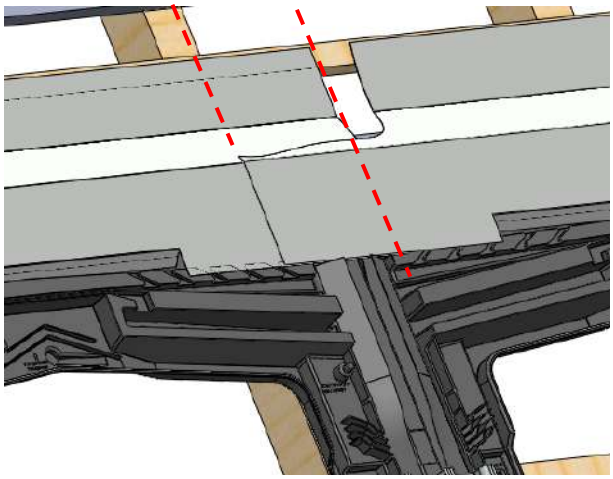


Annex n° 8

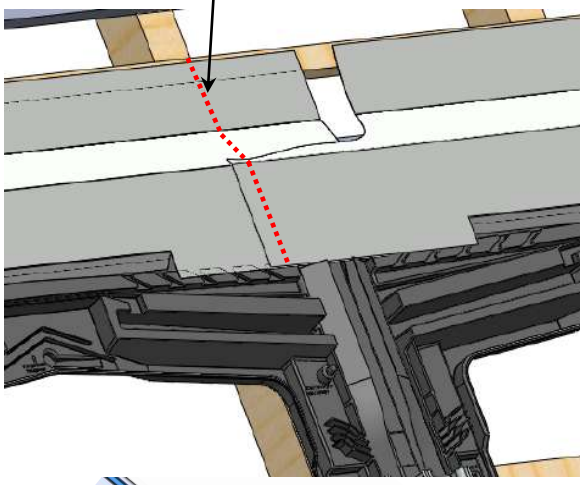
B. Metal flashings to be tailor made

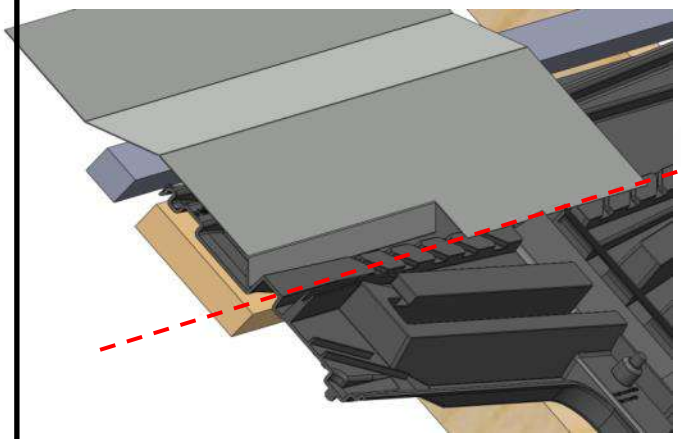
B-3 Field PV top / Metal flashings

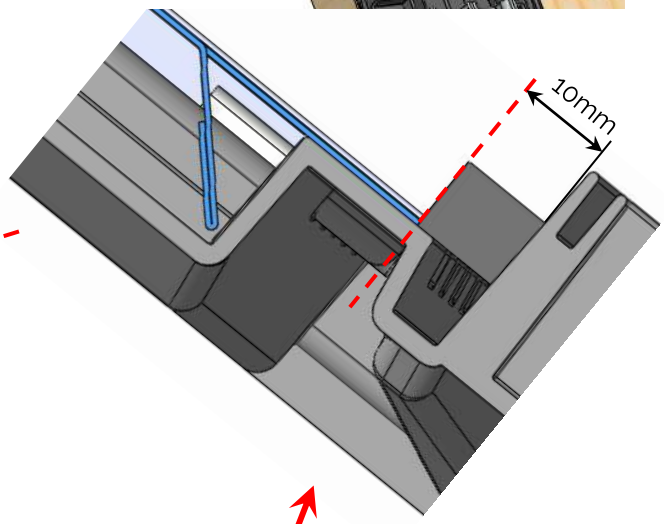
4) 200mm MINI

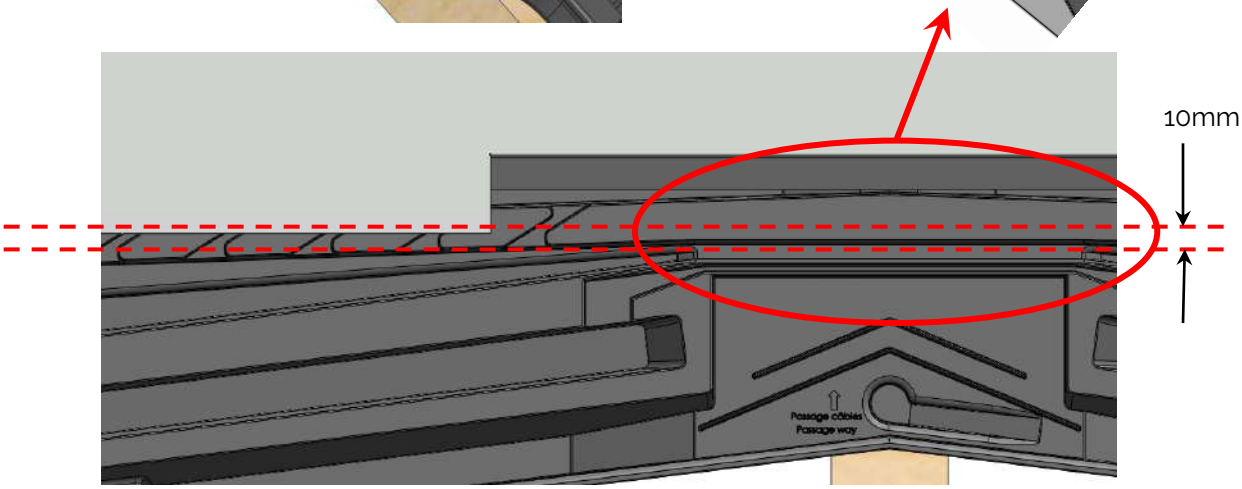


Butyl seal





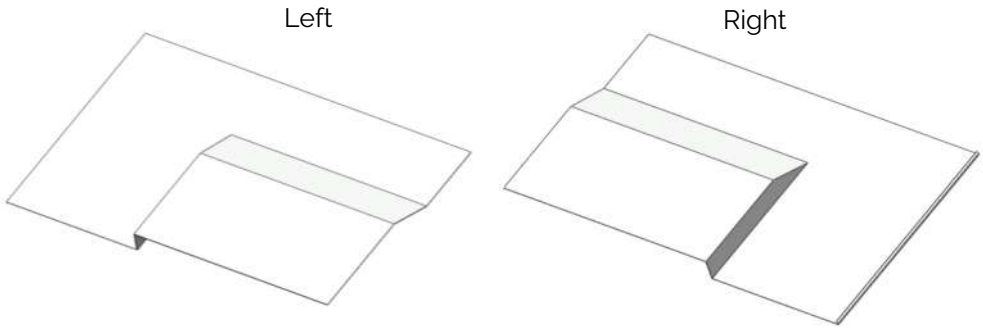


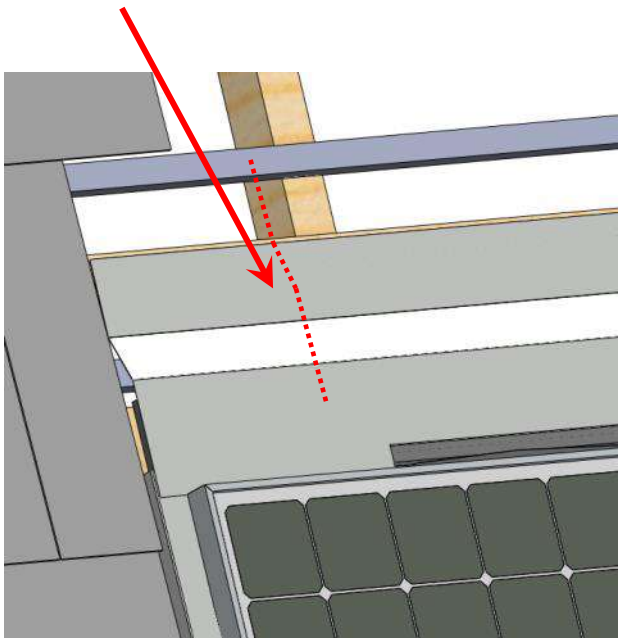


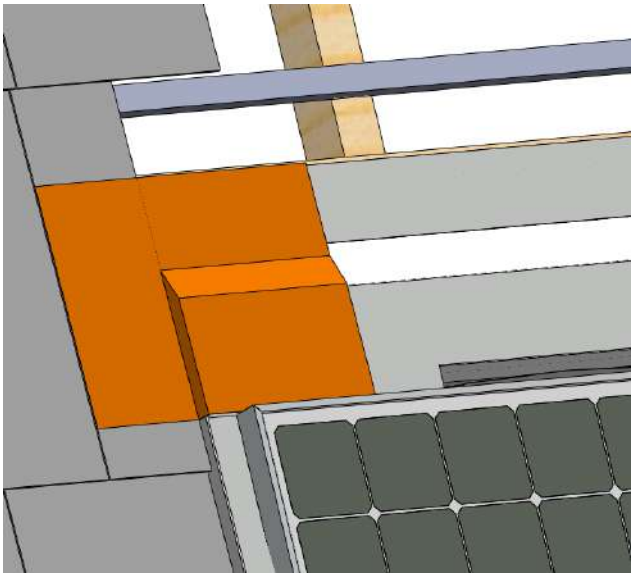
Annex n° 8

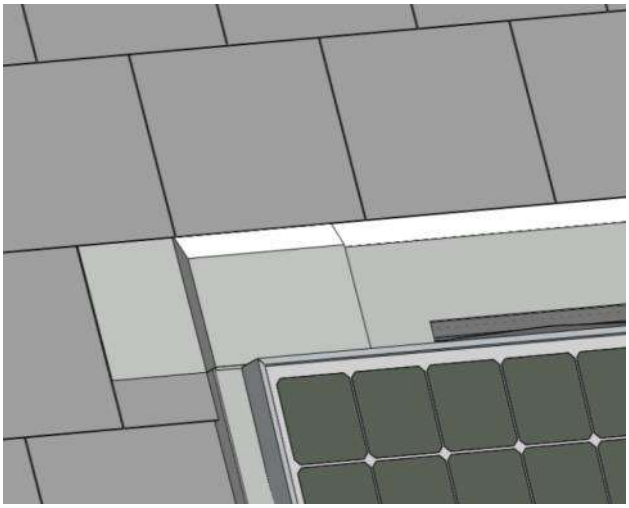
B. Metal flashings to be tailor made

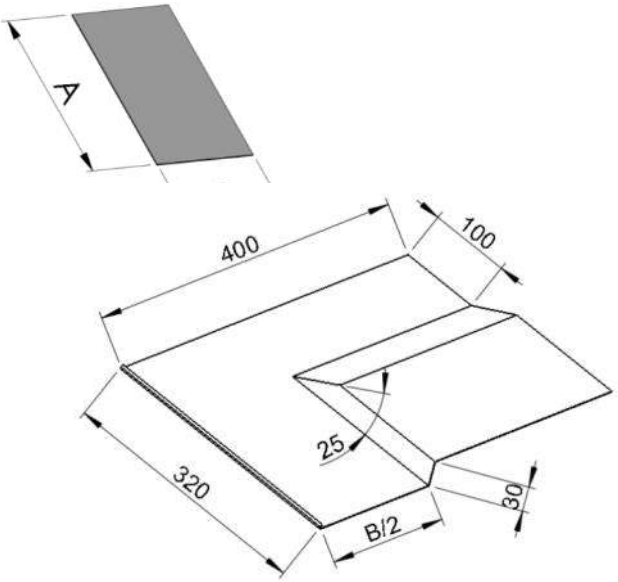
B-3 Field PV top / Metal flashings









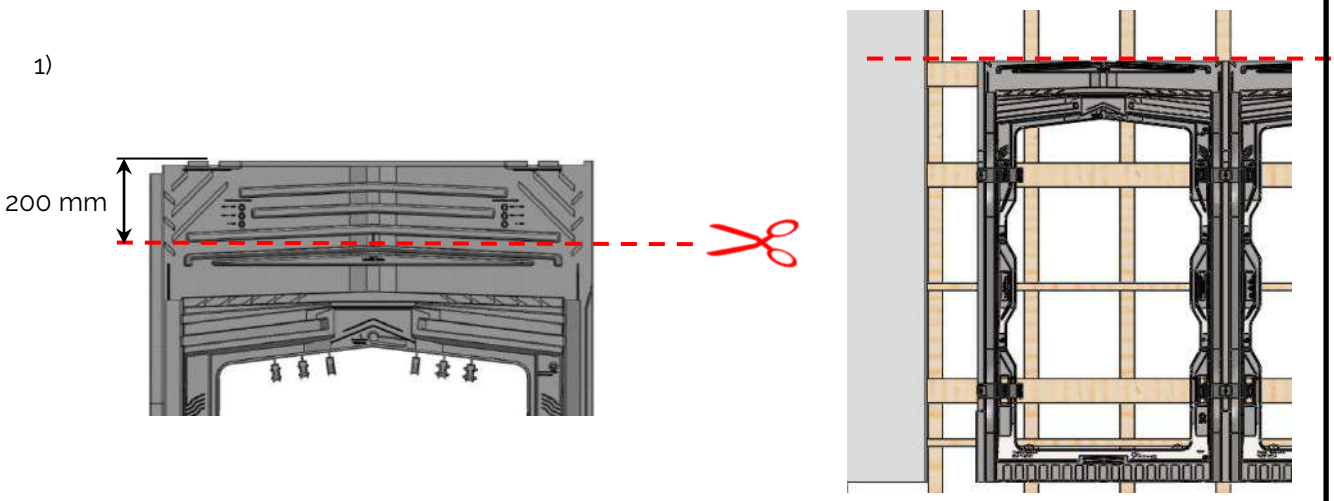


Annex n° 8

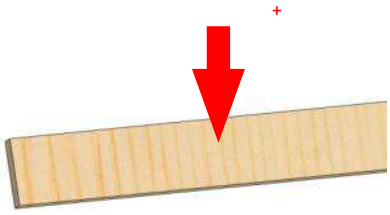
C. Zinc flashing with standing seams

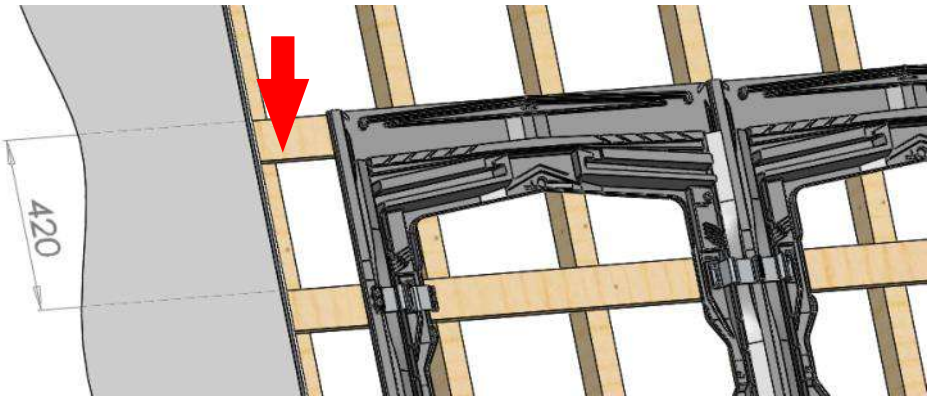
C-1 Side flashings

1)



2)

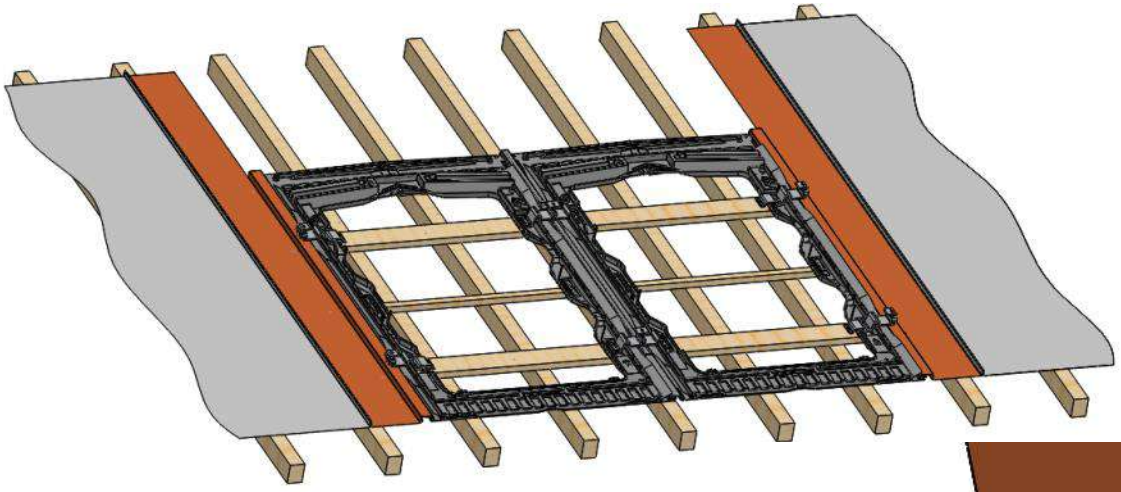


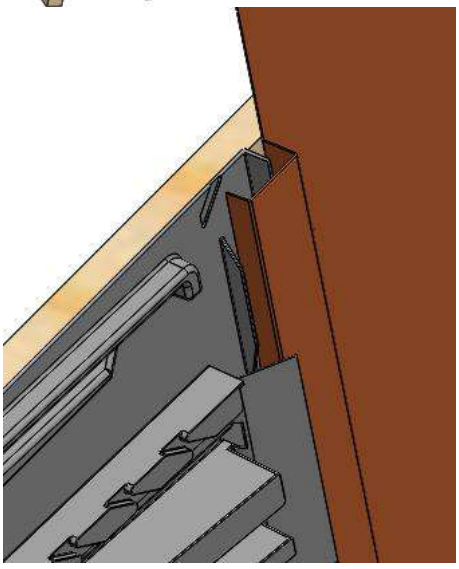


Annex n° 8

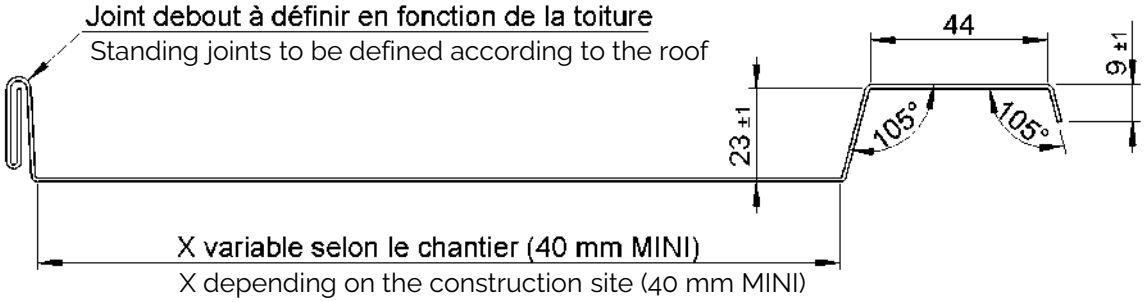
C. Zinc flashings with standing seals

C-1 Side flashings





(haut du champ PV)
(Field PV top)

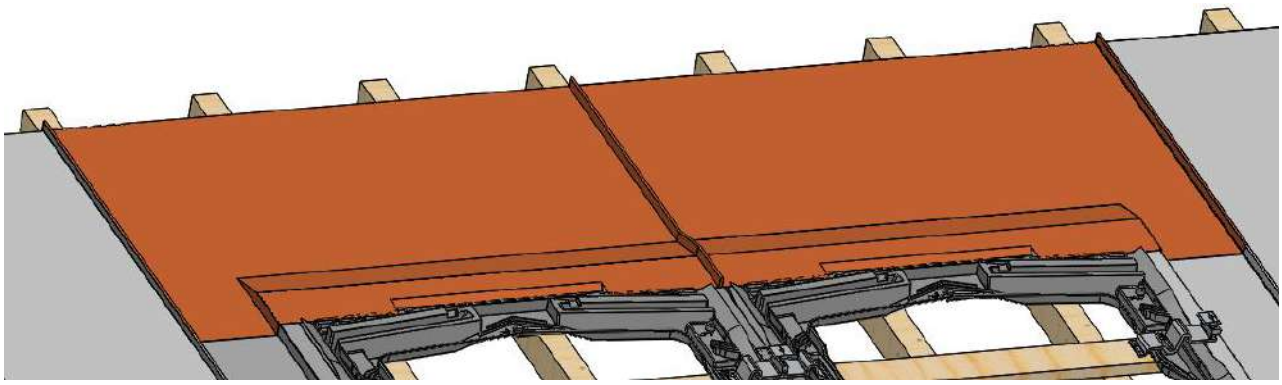


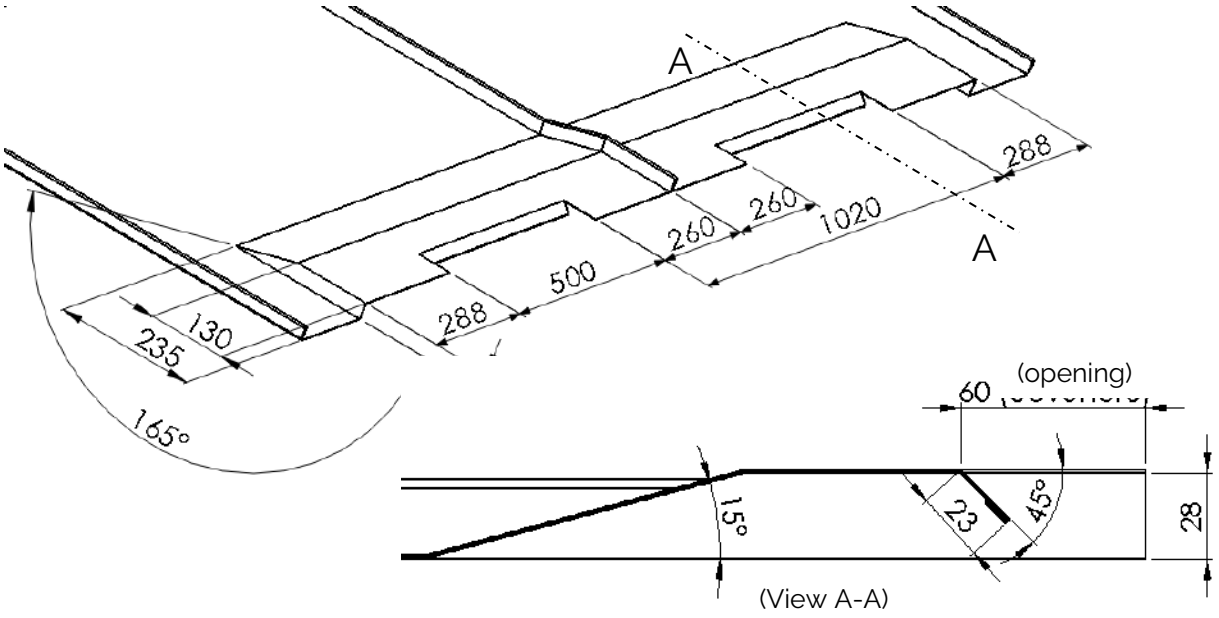
Side flashings (symmetrical right and left Side flashings)

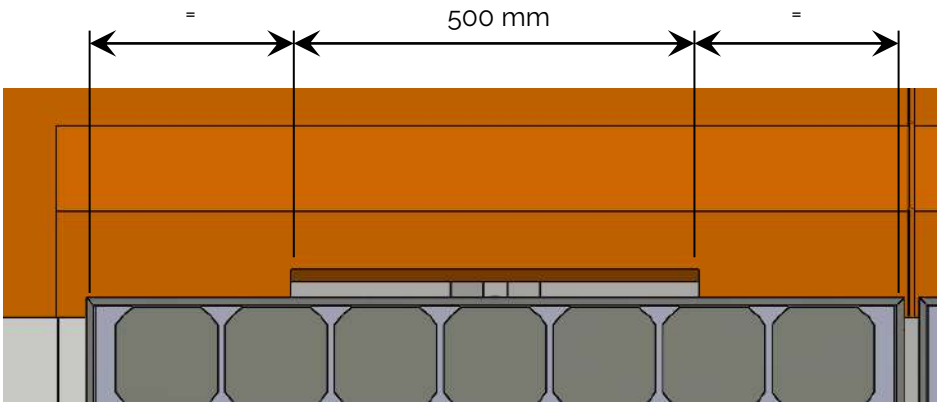
Annex n° 8

C. Zinc flashings with standing seals

C-2 Field PV top





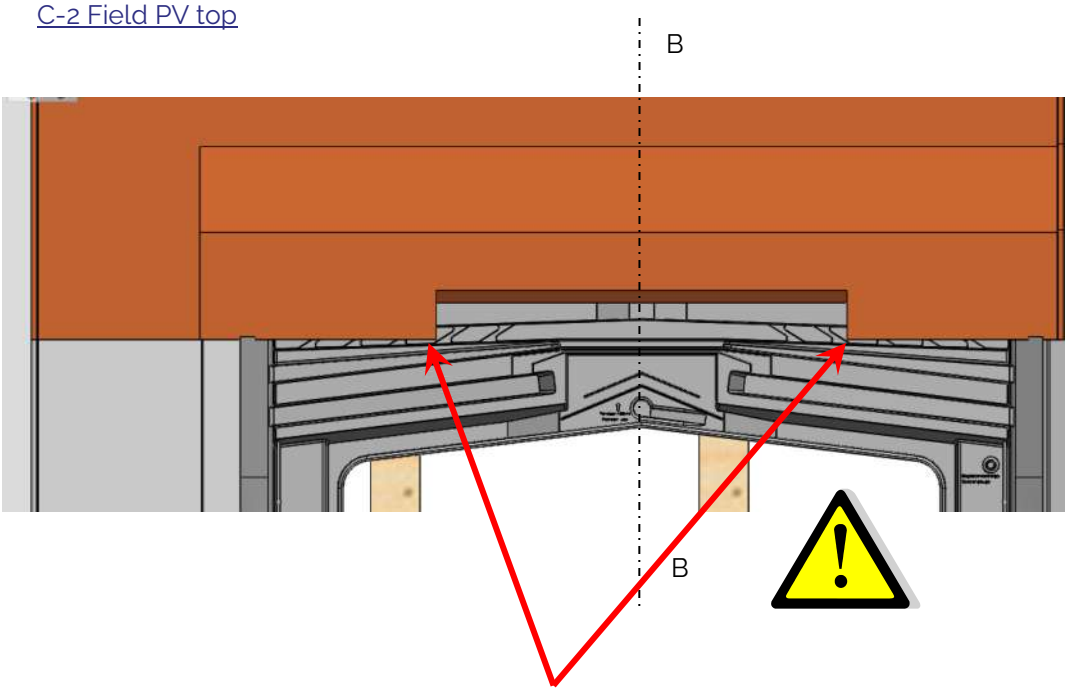


Top flashing

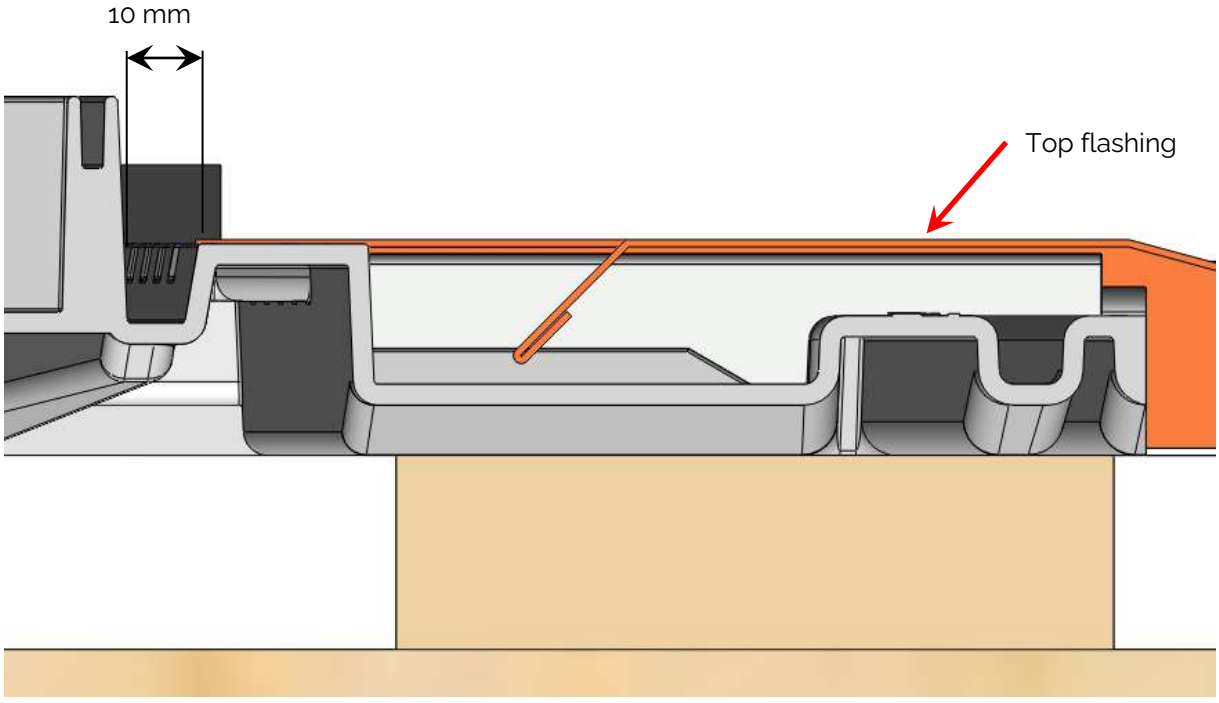
Annex n° 8

C. Zinc flashings with standing seals

C-2 Field PV top



No contact of the sheet on the vertical frame wall



(View B-B)

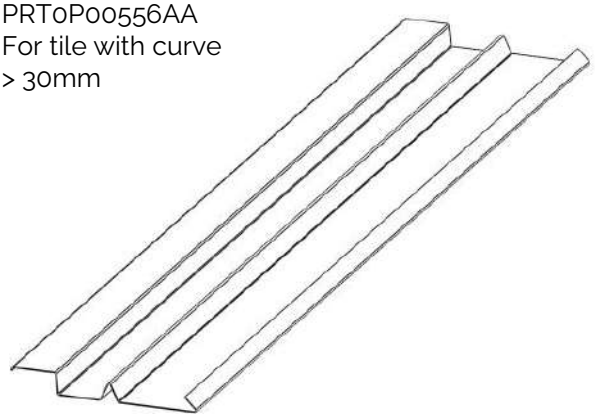
Top flashing

Annex n° 9

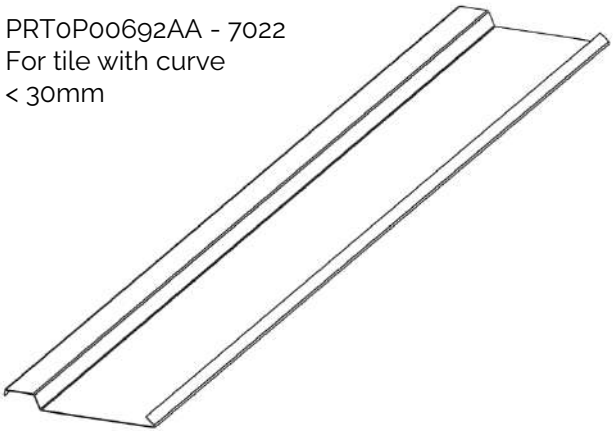
Metal flashings to be tailor made

Side flashings
Continuous flashing

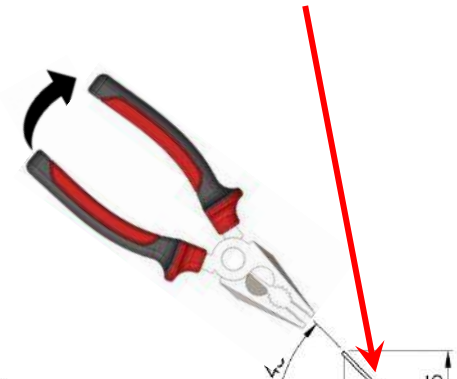
PRT0P00556AA
For tile with curve
> 30mm



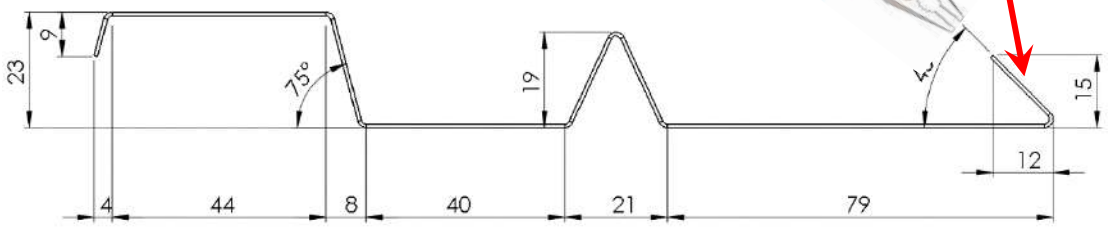
PRT0P00692AA - 7022
For tile with curve
< 30mm



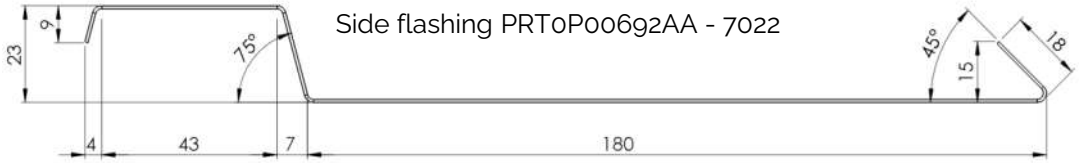
EASY ROOF EVOLUTION side flashings can be replaced by metal channels.
These can be placed on the left or on the right of the field.
The recommended length is 1100mm.
A 230mm overlap is necessary between the channels in the direction of the roof slope.
The overlap between two metal sheets is made by opening the fold in the lower sheet with pliers



Side flashing PRT0P00556AA



Side flashing PRT0P00692AA - 7022

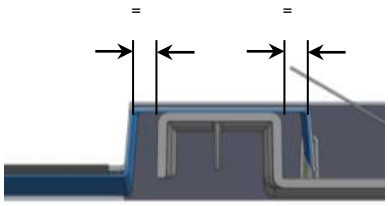


Annex n° 9

Metal flashings to be tailor made

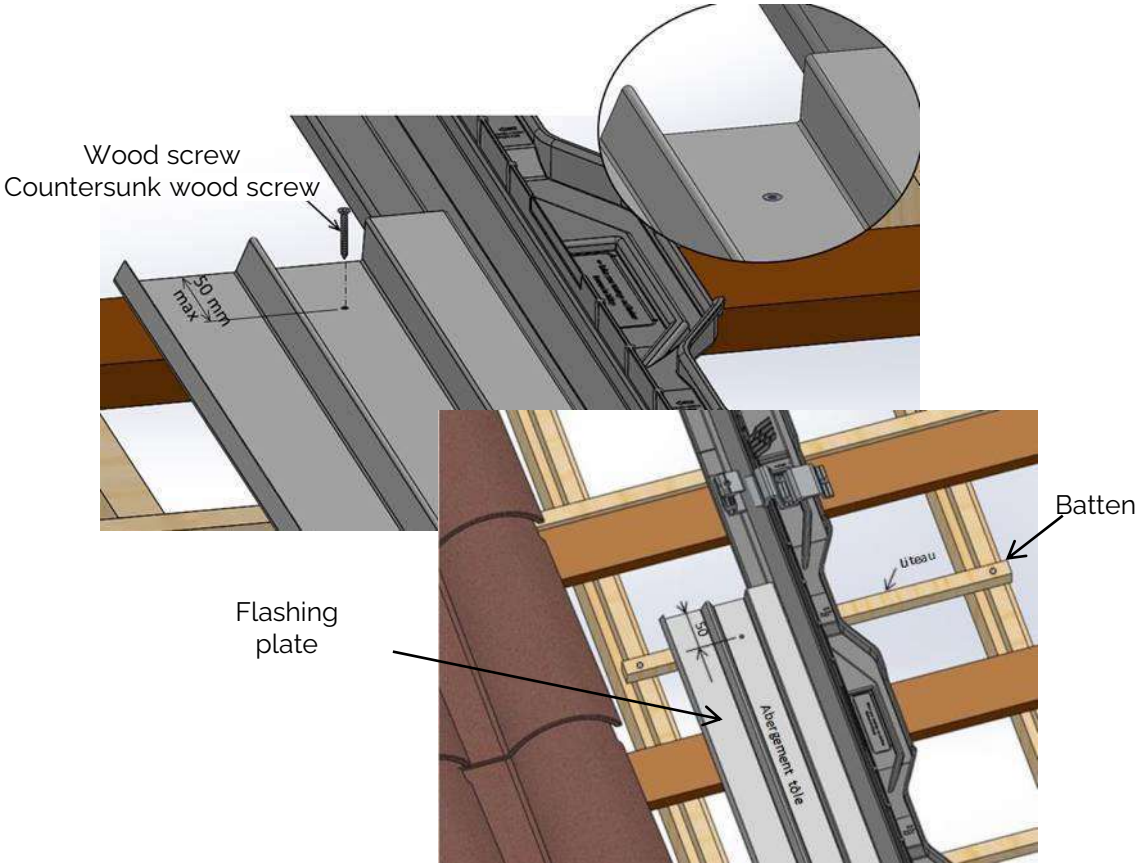
Side flashings
Continuous flashing

NB : Indications applicable to side flashings
PRT0P00556AA and **PRT0P00692AA - 7022**



Position the flashing
on the EASY ROOF EVOLUTION frame.
Leave an even space on either side.

Drill a hole of the right size for a countersunk stainless steel wood screw (not supplied) at a maximum of 50mm from the top of the plate.
Tighten the screw until it is flush with the surface of the plate.
When it is not possible to fix the flashing to a support batten, a batten of the same thickness must be added.
This batten will rest on a rafter on either side and will be fixed in place by two wood screws.



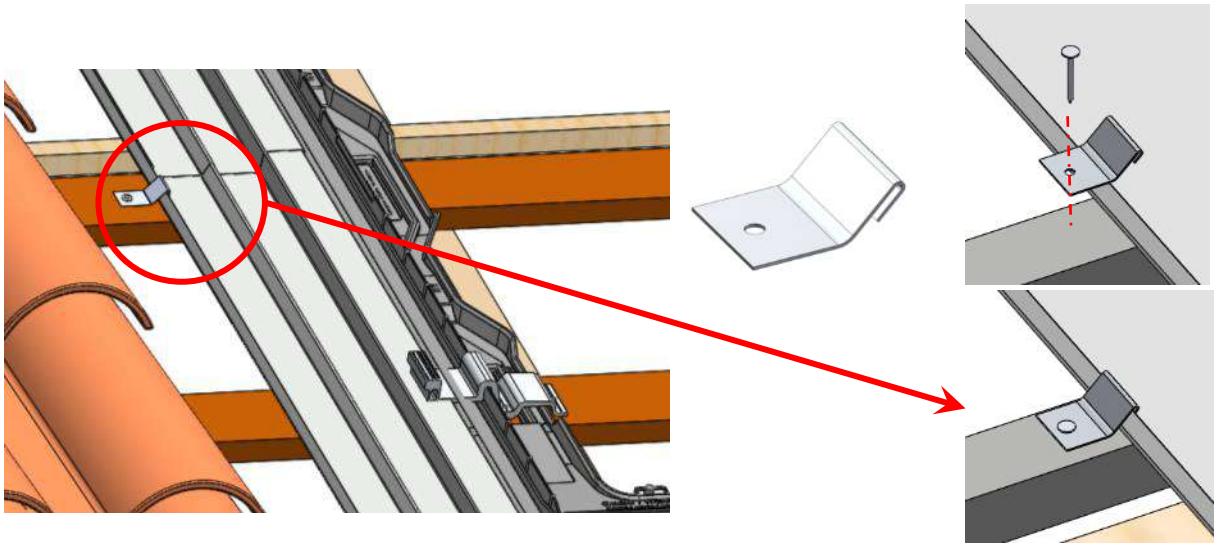
Annex n° 9

Metal flashings to be tailor made

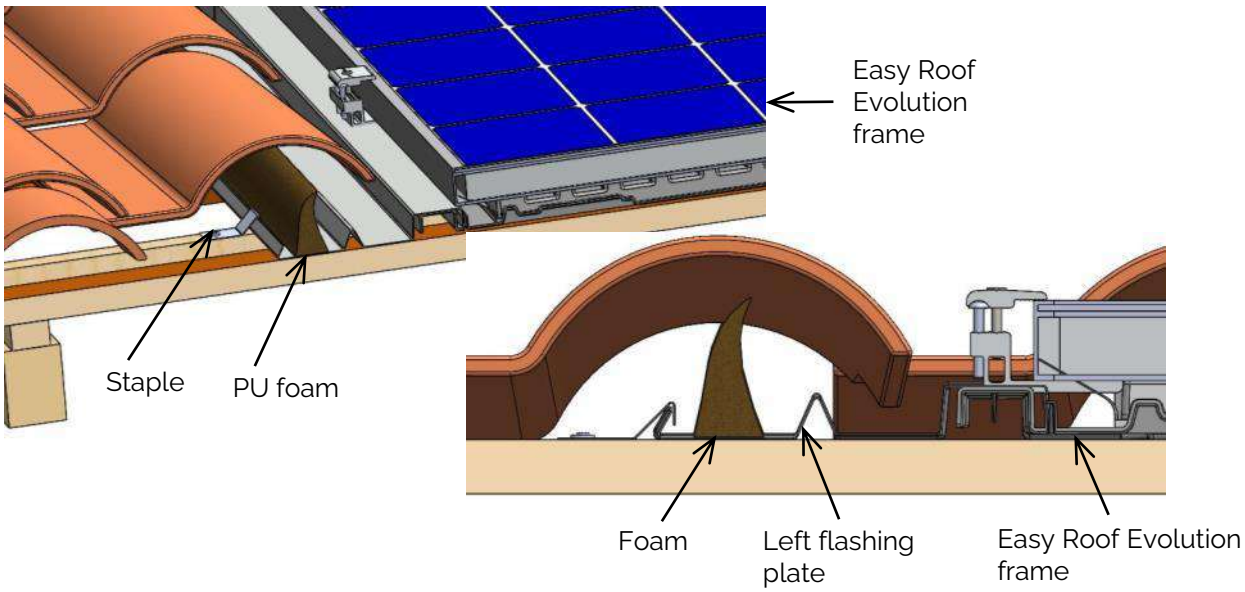
Side flashings
Continuous flashing

NB : Indications applicable to side flashings
PRT0P00556AA and **PRT0P00692AA - 7022**

Fix the flashing plates in place with metal staples.
Nail or screw, at least 2 staples per flashing (1 at the overlap + in the middle of the flashing) onto the support batten or failing that a batten of the same thickness.



Add foam seals (of type Illmod 600 Tremco-Illbruck) between the sheet metal flashing and the bottom of the tiles.

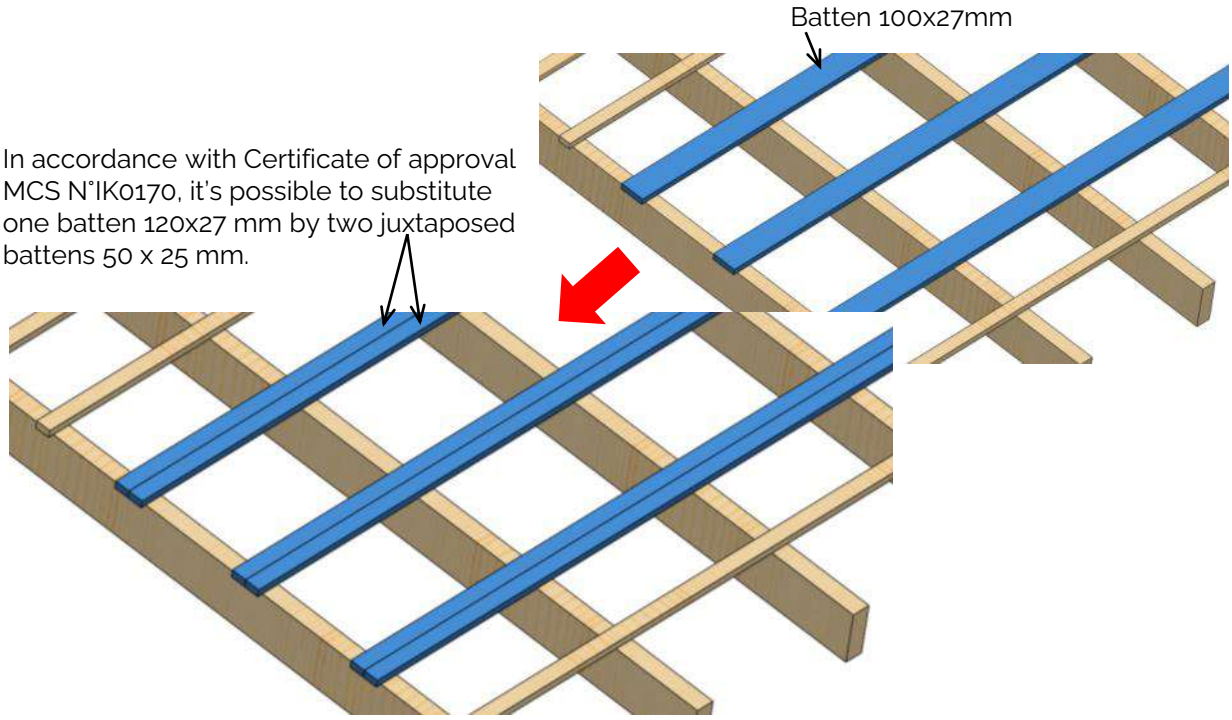


Annex n° 10

Only for UK market

BRE Test report N°P114660 – 1000 26th March 2019

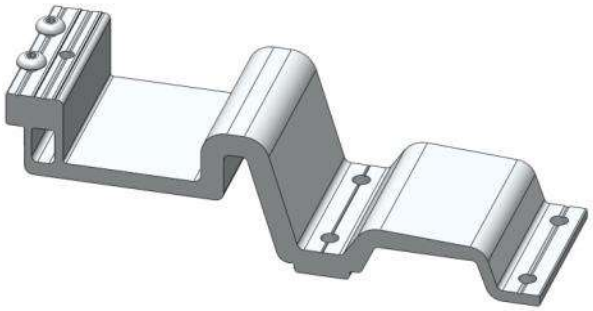
Assembly instructions for UK with battens 50 x 25 mm

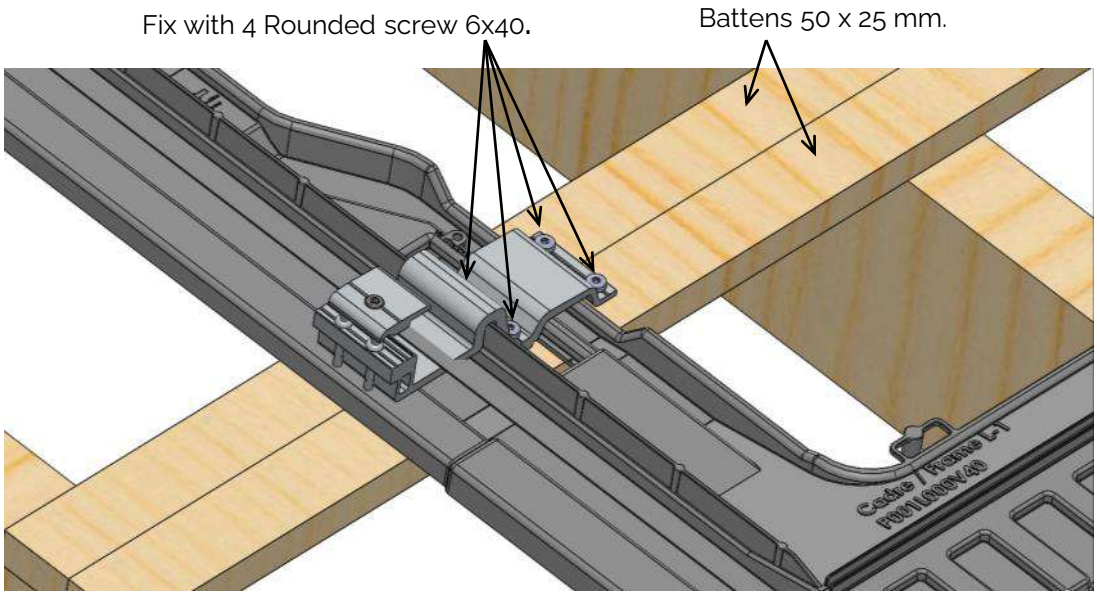


In accordance with Certificate of approval MCS N°IK0170, it's possible to substitute one batten 120x27 mm by two juxtaposed battens 50 x 25 mm.

In this case, the ends of the field, use only nd bracket evolution **A035V40** (4 drill holes)
with 4 Rounded screw 6x40.

In this case only, at the ends of the field, use the fixing bracket A035V40 (4 fixing holes).



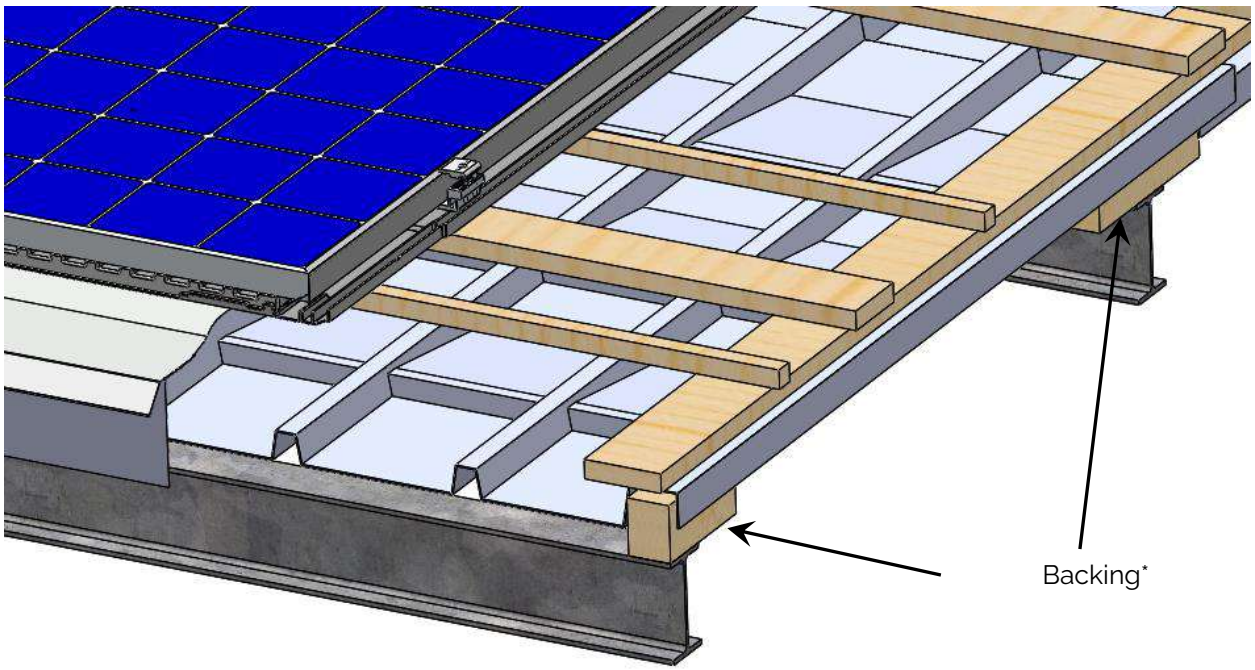


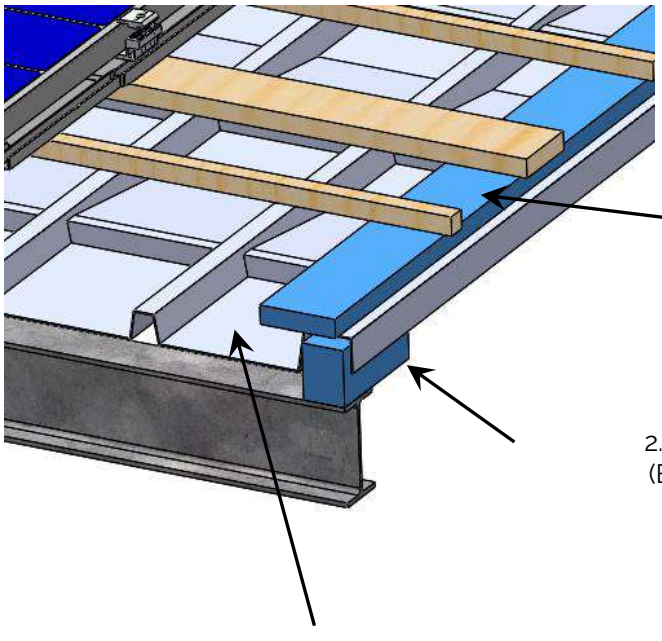
Appendix 11

Installation on roof covering panel

Example of standard panel:

- Polysol
- Ranger





3. Add wood above
(cross-section defined by calculation)
4. Attach the wood to the backing structure

1. Add backing* underneath
2. Fix everything to the roof structure
(Backing* thickness based on the panel)

(*) aluminium profile or wooden backing

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