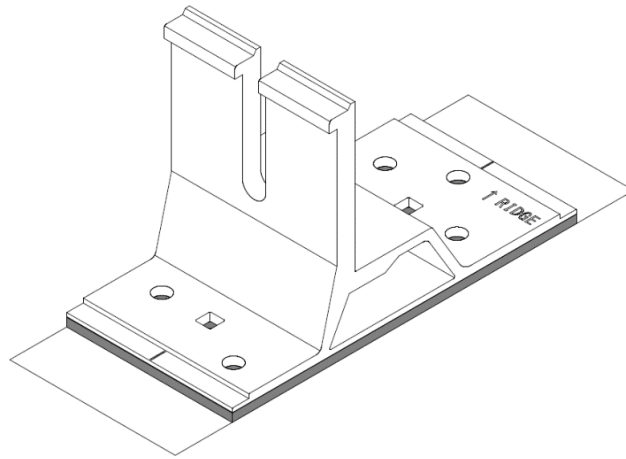


# RT-PLUS®



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# Installation Manual

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## Introduction

- Please review this manual thoroughly before installing the RT-PLUS mounting system.
- Installers are recommended to wear appropriate protective gear in accordance with OSHA (Canada: CCOHS).
- Aside from reading this manual, please review the P.E. Stamped Engineering Letters for the products for your State to ensure adequate strength.
- Be sure to use the included wood screws and butyl for installation. Use of third-party products will invalidate the Roof Tech Limited Warranty and the P.E. Structural Letters.
- PE Stamped letters for the rail option are available at <https://roof-tech.us/support/>
- Please refer to the respective manufacturer's installation manuals for components other than RT-PLUS.
- Ensure safe installation of all electrical and mechanical aspects of the PV array.
- Follow the manufacturer's instructions for PV modules and rail systems. Pay special attention to the suggested clamping position on the PV module frame.
- Comply with all applicable local or national building codes, standards and industry best practices, including any code that may supersede this manual.
- Ensure correct and appropriate design parameters are used in determining the design loading used for design of the specific installation. Parameters, such as snow loading, wind speed, exposure and topographic factor should be confirmed with the EOR (Engineer of Record), local building official or a licensed professional engineer.
- Ensure that RT-PLUS and other products are suitable for installation location and installation conditions.

RT-PLUS can be installed on low slope roofs (metal, EPDM, TPO, SBS modified

- RT-PLUS can be installed on low slope roofs (metal, EPDM, TPO, SBS modified asphalt/torch-on, asphalt) and steep slope roofs (asphalt shingles, metal). For low slope • Please remove any dust and dirt from the roof surface before installation.
- RT-Butyl is compatible with underlayment such as synthetic fabrics and synthetic resins.
- To maintain butyl performance, avoid installation when ambient temperature is below 22 °F (-5°C) or above 176 °F. (80°C).
- RT-PLUS must be installed on a dry surface.  
To determine whether the dry roof is suitable for RT Butyl installation
  1. Remove the protective paper from RT Butyl.
  2. Press on the mount to the surface. Pull on the base and if the mount adheres to the roof, then the roof is suitable for installation.
- Roof Tech recommends a thermal splice (a gap between rails) every 14 feet; however, the installer must determine this based on the rail system installation instructions.
- The installer must also determine the maximum allowed span and cantilever design parameters recommended by the rail system manufacturer.

## Periodical Inspection

- It is recommended to regularly inspect the solar module array and check for any loose components or signs of corrosion. If any loosened fasteners are found, tighten them or replace them immediately.
- If the PV modules need to be removed for maintenance or replacement, ensure that the system's power is turned off.
- To avoid electric shock, cover the solar module array with a shading sheet to stop power generation before performing any work.
- Follow the manufacturer's installation manual, maintenance guide, and the RT-PLUS installation manual when carrying out maintenance on the solar modules.
- Do not perform maintenance during rainy or windy conditions.

## Tools Required for Assembly

- Electric Drill
- Hex Bit Socket (extended) (8mm or 5/16")
- Hex Bit Socket (1/2", 9/16")
- Center Punch (for Metal Roof)
- Hammer
- Drill Bit 1/4" or  $\phi$  6.5 mm (for Composite Slate)
- Measuring Tape
- Chalk line
- Torque Wrench (1/2in, 9/16in)
- Caulking gun

※Please prepare any other tools as necessary.

## Technical Notes

- Proper torque values for a wood screw will vary depending on the rafter and/or deck characteristics; hardness, age, and moisture of the wood. Tighten the wood screws until the washer stops rotating.
- Avoid using an impact driver, as rapidly tightening bolts and nuts may cause seizing or snap the screw head off.
- When driving the wood screws into the wood, always keep a hand pressed down on the mount.

## Installation Safety

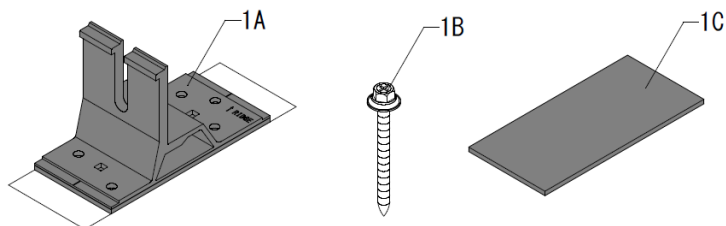
Installation involves work on a sloping roof. In addition, it is necessary to work with tools and heavy materials, so please observe the following:

- Use properly anchored fall protection equipment.
- Use caution to prevent objects from falling or dropping off the roof area.
- Cordon off ground areas directly beneath the roof work area when possible.
- Always use personal protection equipment such as safety glasses, gloves, etc.
- Do not perform installation in excessively wet, windy, or inclement weather conditions.
- When working in hot weather, work crews should take care to prevent symptoms of overheating or dehydration.
- Use proper lifting and carrying techniques when handling heavy components at the job site. If conditions are challenging for moving PV modules to the roof area, use a mechanical lift.
- Follow best practices when working with high-voltage electrical equipment.
- Do not anchor fall protection equipment to roof mounts, or any other inappropriate roof structure.

## 1. RT-PLUS Components

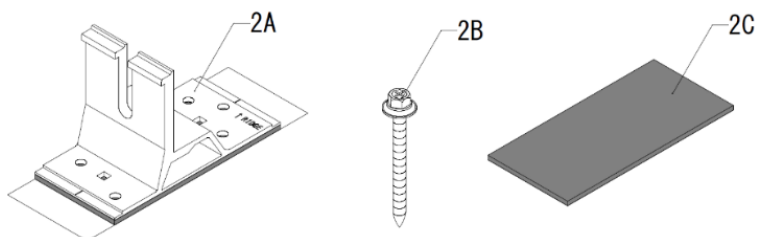
### ① RT-PLUS 3/8BK Set (RT4-00-PLUS-38BK-60)

	Item	QTY/BOX
1A	RT-PLUS 3/8 BK	20
1B	Screw 5.0×60	40
1C	RT-Butyl	4



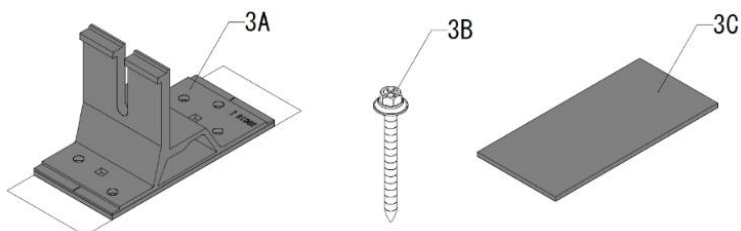
### ② RT-PLUS 3/8ML Set (RT4-00-PLUS-38ML-60)

	Item	QTY/BOX
2A	RT-PLUS 3/8 ML	20
2B	Screw 5.0×60	40
2C	RT-Butyl	4



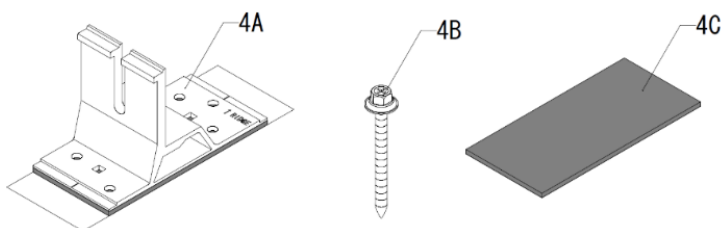
### ③ RT-PLUS 5/16BK Set (RT4-00-PLUS-5/16BK-60)

	Item	QTY/BOX
3A	RT-PLUS 5/16 BK	20
3B	Screw 5.0×60	40
3C	RT-Butyl	4



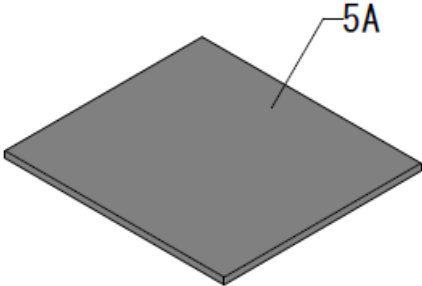
### ④ RT-PLUS 5/16ML Set (RT4-00-PLUS-5/16ML-60)

	Item	QTY/BOX
4A	RT-PLUS 5/16 ML	20
4B	Screw 5.0×60	40
4C	RT-Butyl	4



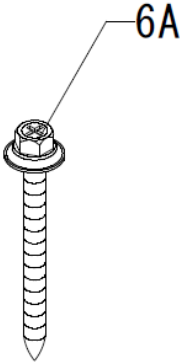
⑤ Butyl (Optional)

	Item	QTY/BOX
5A	RT-Butyl	10



⑥ Screw (Optional)

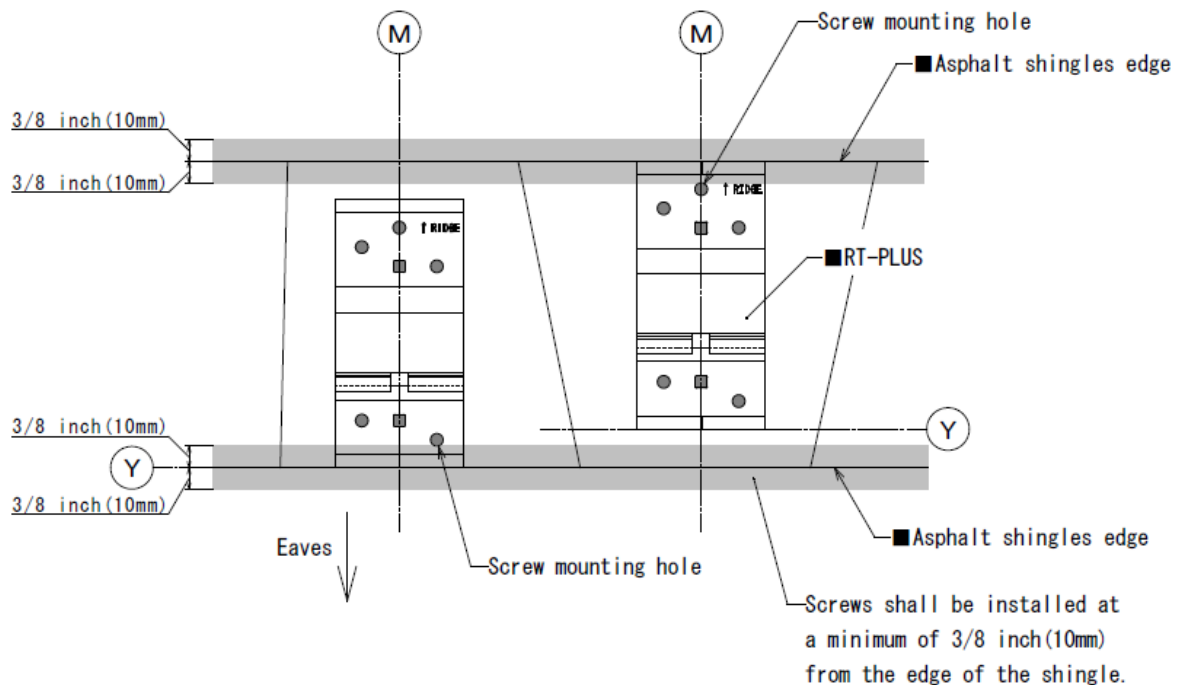
	Item	QTY/BOX
6A	Screw 5.0×60	100



## 2. Installation on Asphalt Shingles Roof

① Chalk a vertical line (M-line) and a horizontal line (Y-line) according to the layout plan to indicate the position for the RT-PLUS position.

- (i) M-line: Center of RT-PLUS (For rafter mounting, center of the rafter; for deck mounting, any chosen spot)
- (ii) Y-line: Edge of RT-PLUS

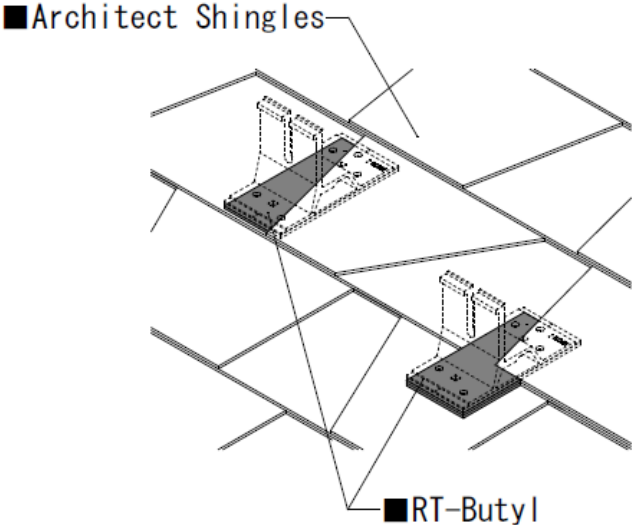


- ※ Please check PE Stamped letters for RT-PLUS's maximum span.
- ※ Minimum spacing between the wood screw and the edge of the asphalt shingle should be at least 3/8" (10mm).

②Adjust the RT butyl tape to match the height of the upper shingle.

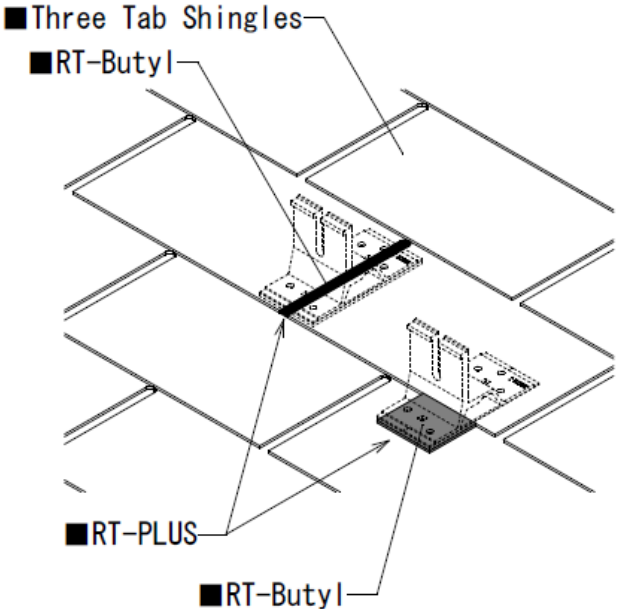
### Architect Shingles

If there is a height difference in the roof surface where the brackets are to be placed, use butyl to make the surface of the roof even. The butyl must be cut.

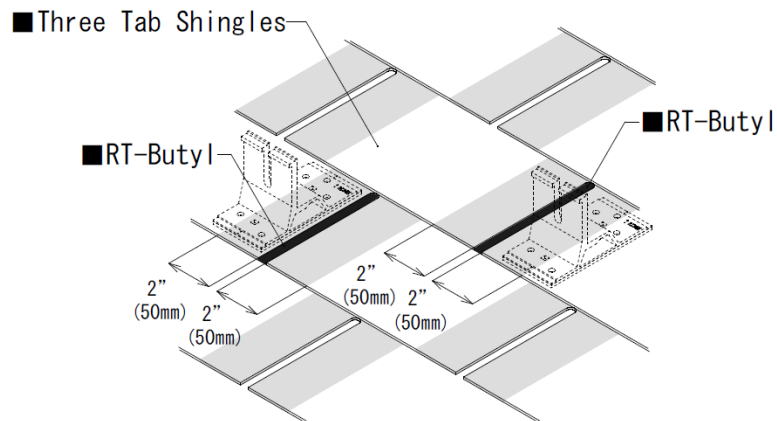


### Three Tab Shingles

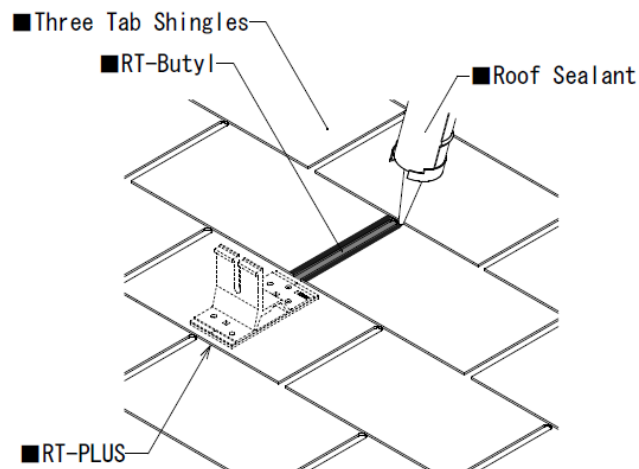
When installing RT-PLUS on a slit, fill the slit with butyl. If there is a step, use butyl to make the surface of the roof flat. Please cut the butyl before use.



If there is a slit within 50mm of the wood screw location, fill in with the additional RT butyl tape. The slit must be filled with RT butyl tape.

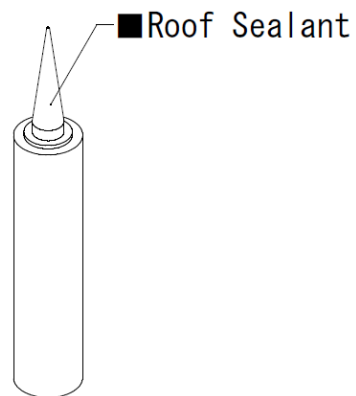


If there is a slit on the ridge side of the RT-PLUS, fill the slit with butyl and apply sealant around the butyl. Cut the butyl before use.

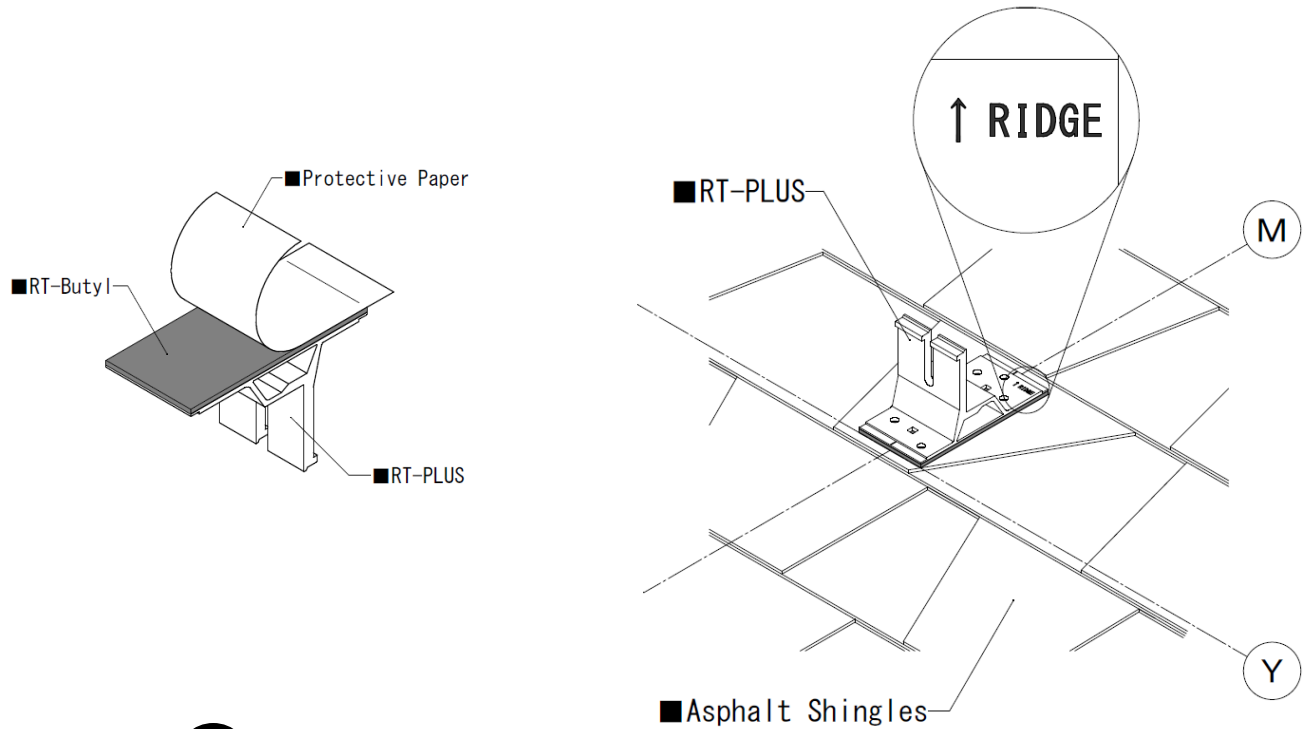


**【Roof sealant recommended products】**

- Henry : 208R, 209, 925 (Black)
- Geocel:S2, S4 (Black)
- Sashco : Through the Roof
- Boss : 125 (Black)
- Top Industrial: Rain Buster 850, 900
- Chem Link: M1
- NPC Solar Seal 900
- GE All Purpose 100% Silicone



- ③ Remove the protective paper under the RT-PLUS, and position along the chalk line. Place, 『↑RIDGE』 on the ridge side.



**! Attention**

Do not leave any protective paper on the surface of the RT butyl tape, it can cause an improper seal and may allow water intrusion under the bracket.

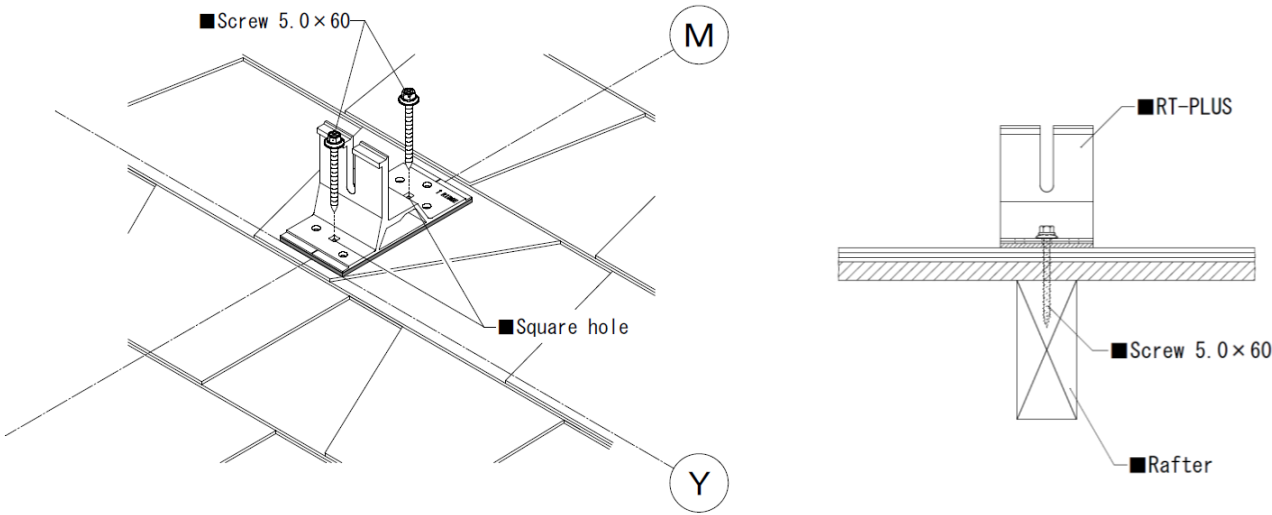
**! Attention**

To maintain butyl performance, avoid installation when ambient temperature is below 22 °F (-5°C) or above 176 °F. (80°C).

- ④ Drive the Screw 5.0×60 while holding the RT-PLUS.

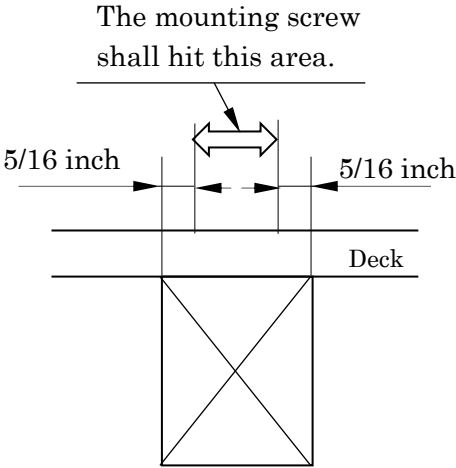
### Rafter Mounting

Mount the RT-PLUS using the square holes.  
Use two wood screws.



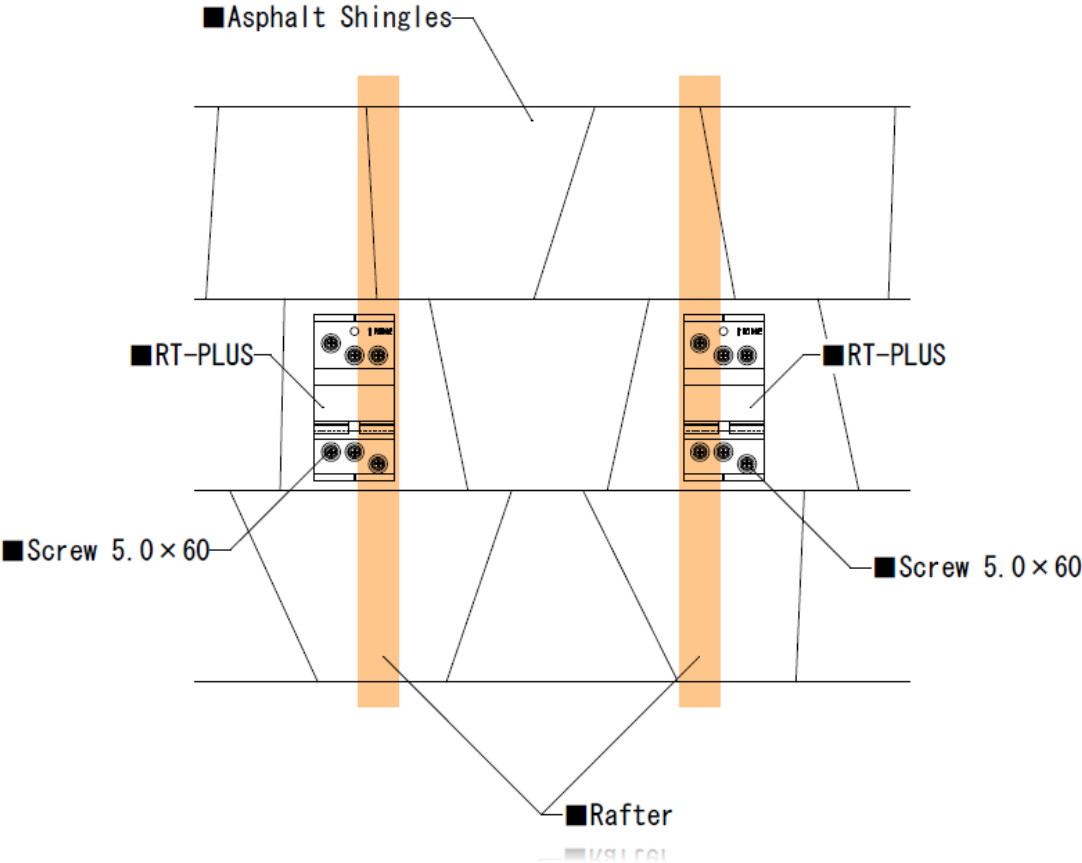
### ! Attention

The wood screw must clear 5/16" from each edge of the rafter.



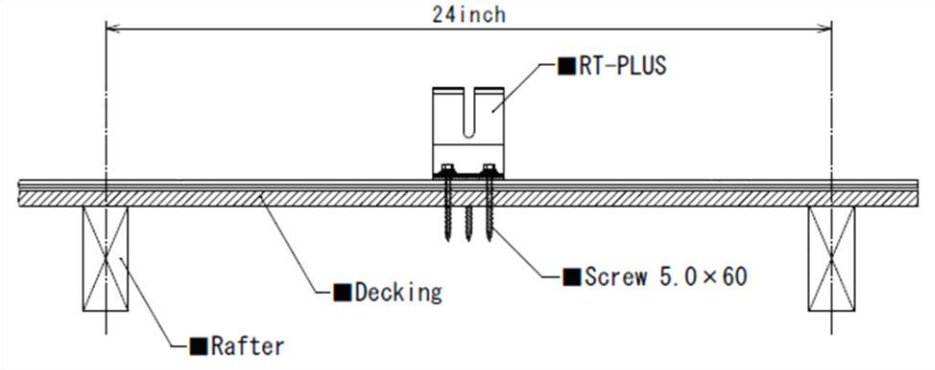
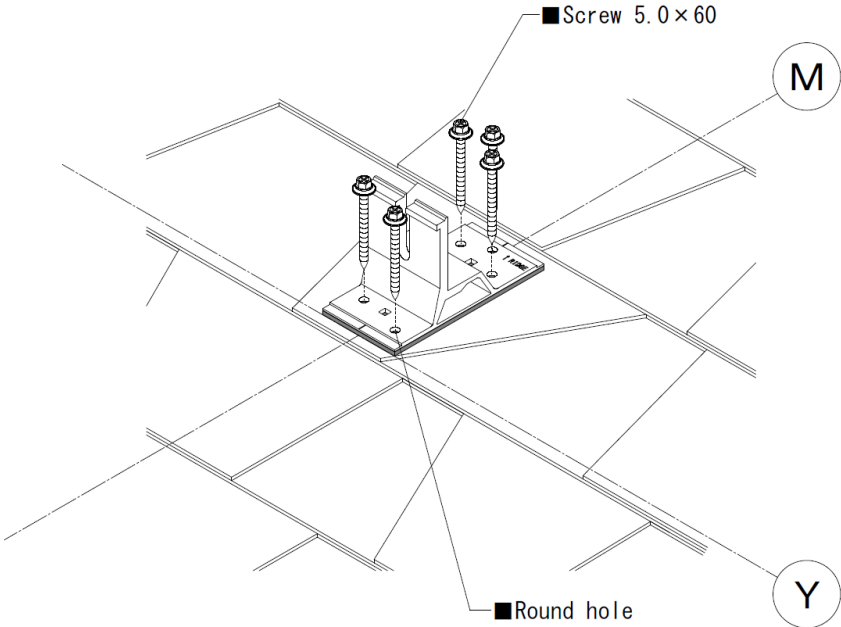
If you miss screwing the rafters, please use off set screw positions as below using six wood screws.

Please refer to the PE Stamped Letters for maximum span adjustment.



### Deck Mounting

Mount the RT-PLUS using the round holes.  
Use five wood screws.

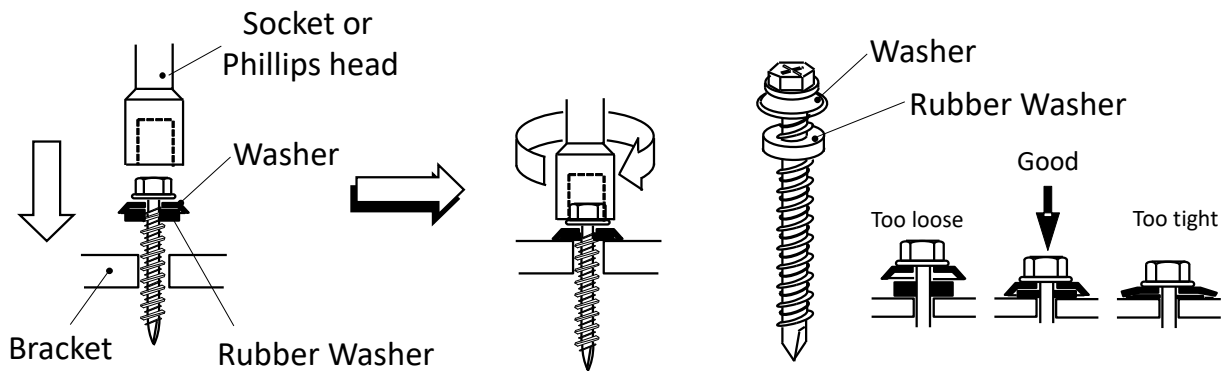


### ! Attention

Each RT-PLUS is shipped with 2 mounting screws. The installer must purchase additional screws when mounting it to the roof deck.

## ! Attention

**Note:** Proper torque values for the screw 5.0×60 will vary depending on the rafter and/or deck characteristics; hardness, age, and moisture of the wood. It should be tightened until the conical washer stops rotating.



**When tightening the screws please tighten all screws equally and avoid using an impact driver as it can over torque the screws or even snap off the head**

## ! Attention

In case the stainless screw hits a nail head:

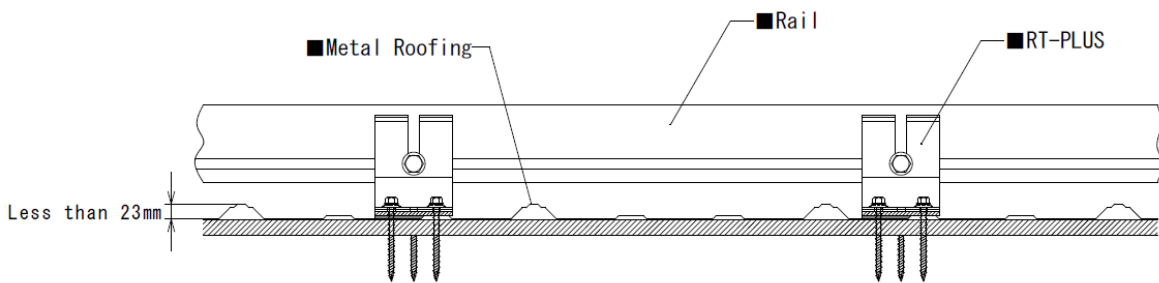
- 1) Tip the driver at an angle.
- 2) Use a 3 mm steel drill to make a hole.
- 3) If possible, remove the nail from underneath.

⑤ Make sure RT-PLUS is securely fixe

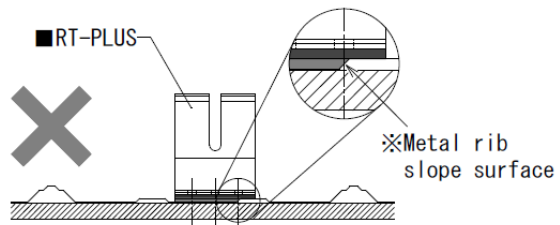
### 3. Installation on Metal Roof

#### ! Attention

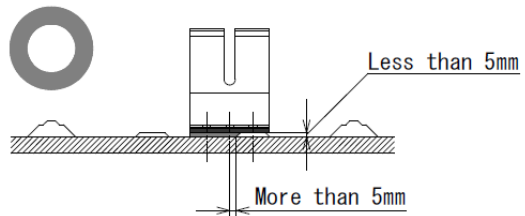
RT-PLUS can be installed on a metal roof with decking.  
 However, the intermediate rib height must be less than 23mm (0.9”).



Install RT-PLUS on a flat surface of the metal roof.

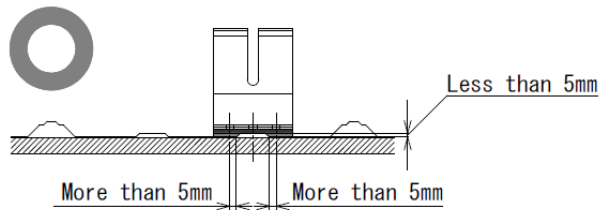


Do not install on the angled surface of the metal rib.



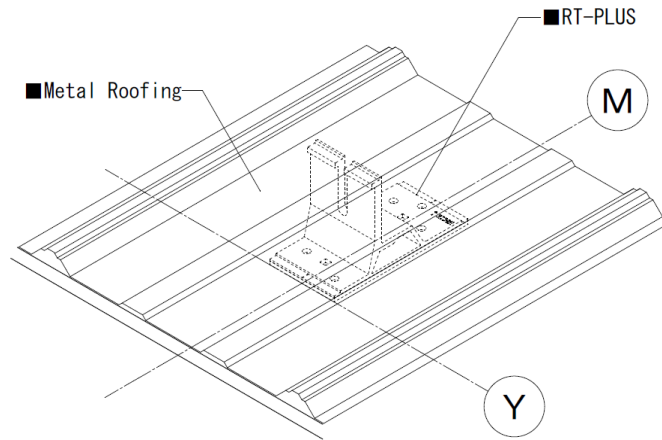
Drive the wood screw on a flat surface.

Also, distance from center of the wood screw to the edge should be more than 5mm (See image on right).

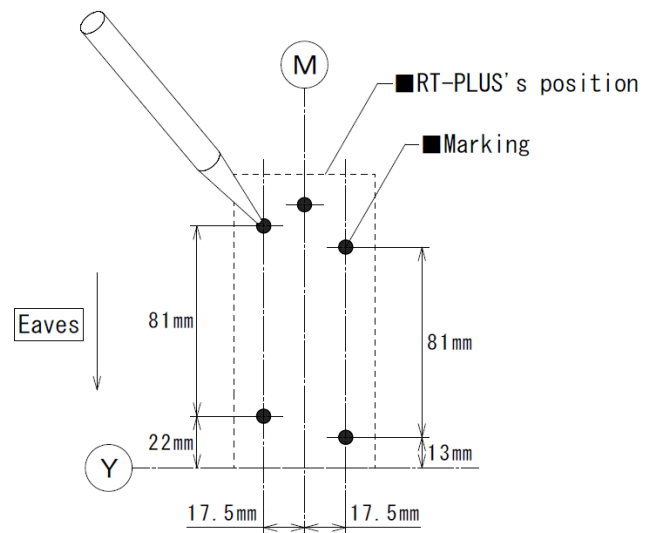


- ① Chalk a vertical line (M-line) and a horizontal line (Y-line) according to the layout plan to indicate the position for the RT-PLUS position.

- ( i ) M-line: Center of the RT-PLUS
- ( ii ) Y-line: Edge of RT-PLUS



- ② Mark the position as shown here on the right.  
 ※ Only for deck mounting.

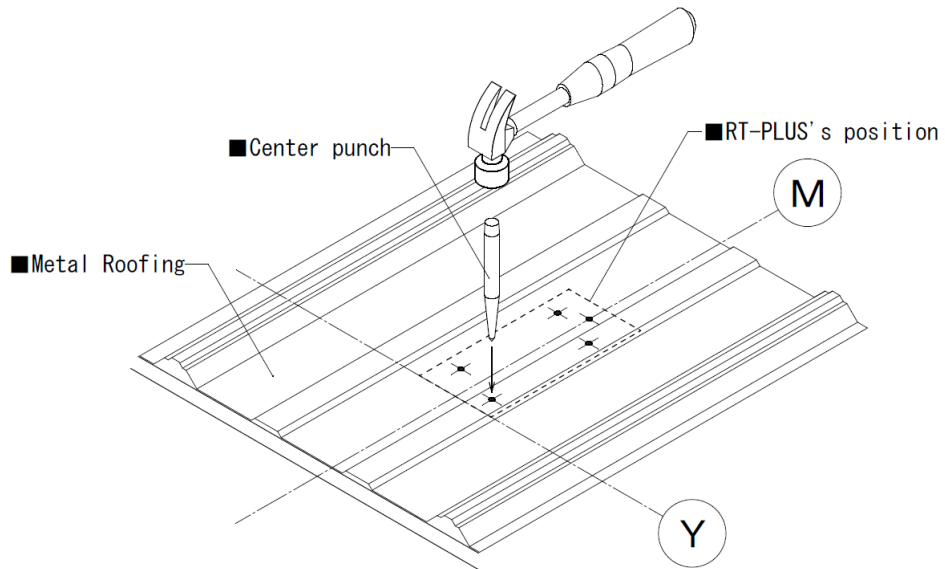


**! Attention**

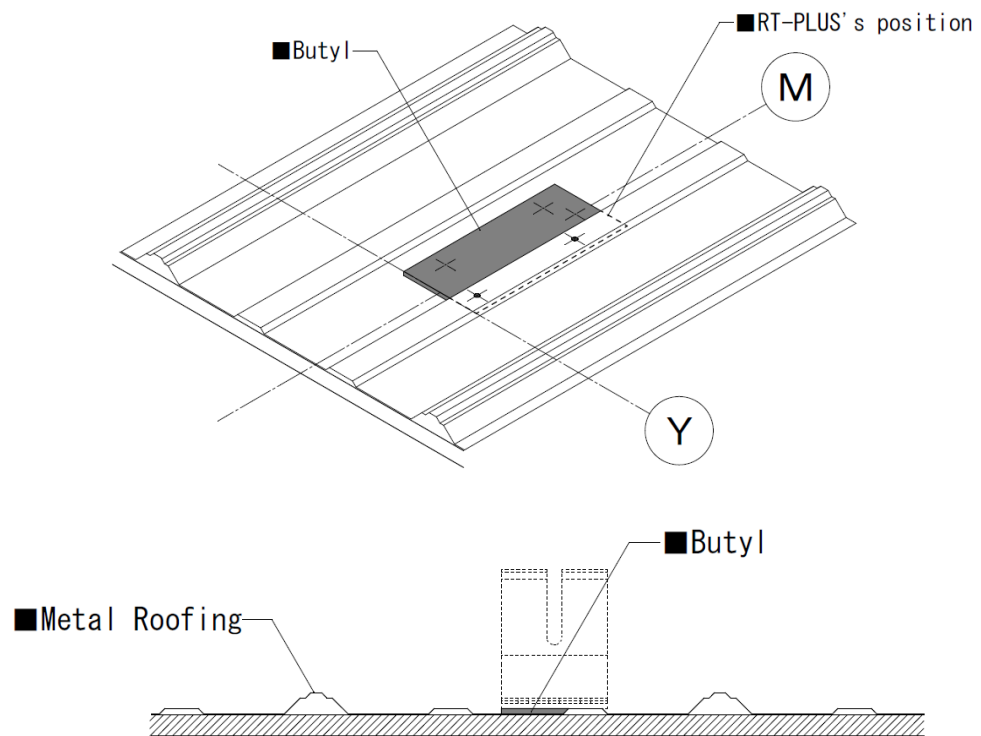
The marking position is not symmetrical.

We recommend using another RT-PLUS to assist with marking on metal roofs. (Remove the butyl and create a jig for the RT-PLUS.)

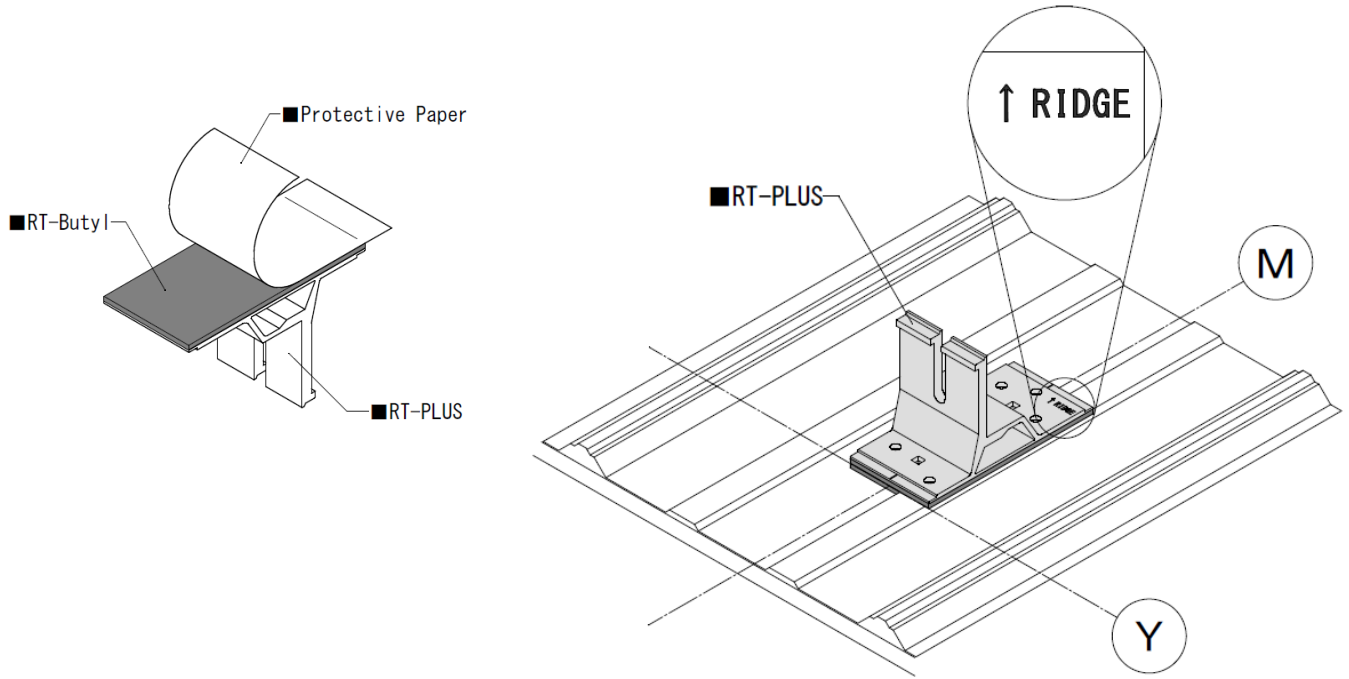
- ③ Use a center punch to make pilot holes.



- ④ Please add a butyl pad (RT - Butyl Spacer) on the surface between the ridges.



- ⑤ Remove the protective paper under the RT-PLUS and place it at specified location. Place、『↑RIDGE』 on the ridge side.



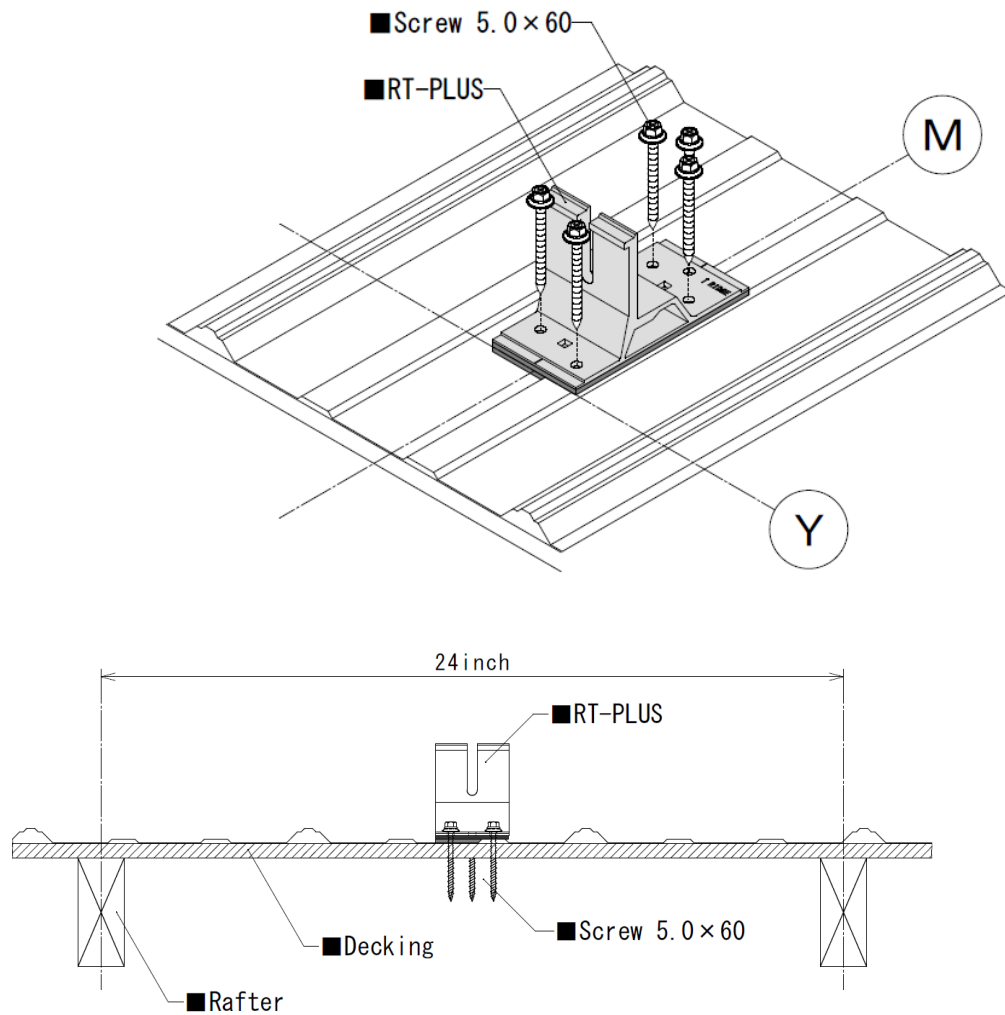
**! Attention**

Do not leave any protective paper on the surface of the RT butyl tape, it can cause an improper seal and may allow water intrusion under the bracket.

**! Attention**

To maintain butyl performance, avoid installation when ambient temperature is below 22 °F (-5°C) or above 176 °F. (80°C).

- ⑥ Drive the screw 5.0×60 while holding the RT-PLUS.  
Use the round holes on the RT-PLUS.  
Use five wood screws.

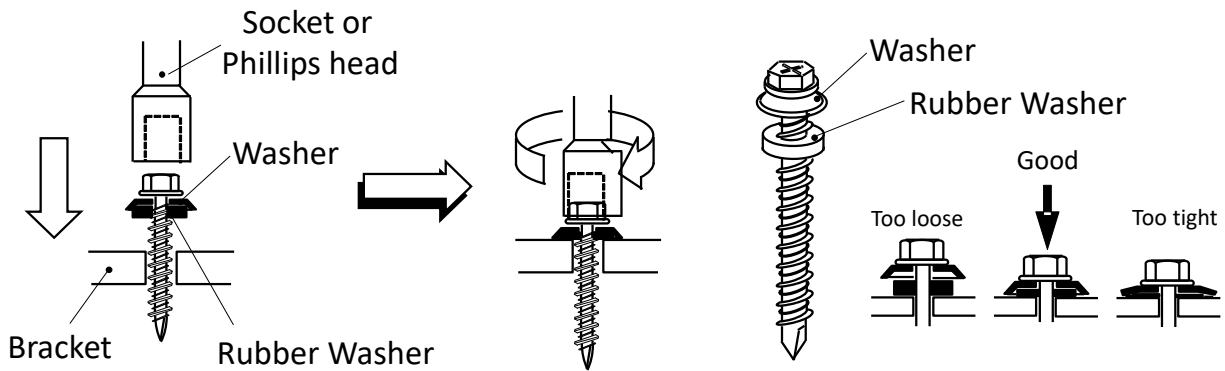


**Attention**

Each RT-PLUS is shipped with 2 mounting screws per set. The installer must purchase additional screws when mounting it to the roof deck.

**! Attention**

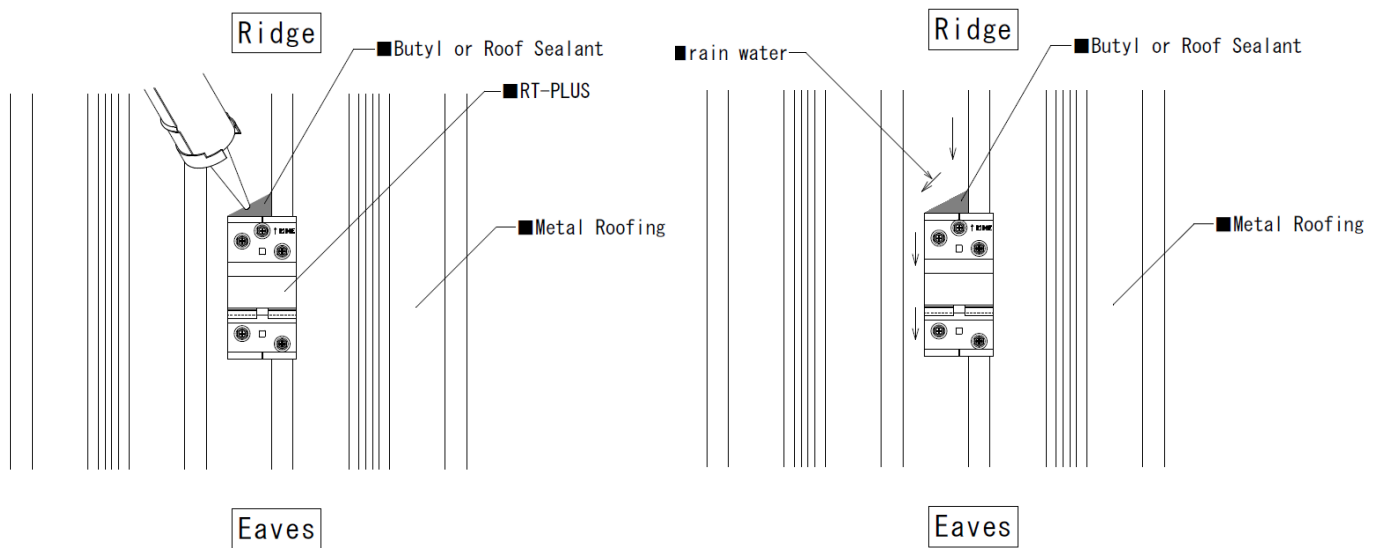
Note: Proper torque values for the 5.0×60 mm screw will vary depending on the rafter and/or deck characteristics; hardness, age, and moisture of the wood. It should be tightened until the conical washer stops rotating.



When tightening the screws please tighten all screws equally and avoid using an impact driver as it can over torque the screws or even snap off the head

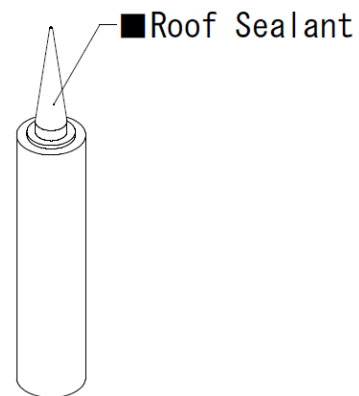
- ⑦ Make sure RT-PLUS is securely fixed.

- ⑧ If the RT-PLUS overlaps with the metal roofing's rib, create a roof cricket on the ridge side of RT-PLUS using RT Butyl tape or a roof sealant.



**【Roof sealant recommended products】**

- Henry : 208R, 209, 925 (Black)
- Geocel: S2, S4 (Black)
- Sashco : Through the Roof
- Boss : 125 (Black)
- Top Industrial: Rain Buster 850, 900
- Chem Link: M1
- NPC Solar Seal 900
- GE All Purpose 100% Silicone

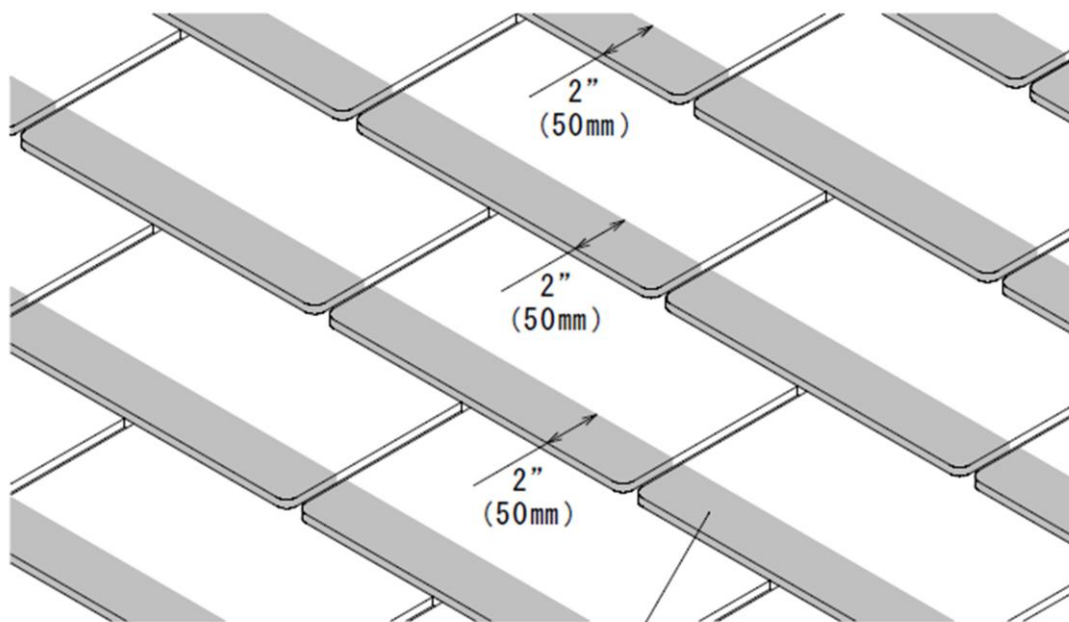


## 4. Installation on Composite Slate Roof

Please verify compatibility between RT Butyl (AlphaSeal®) and Composite Slate manufacturer.

### ! Attention

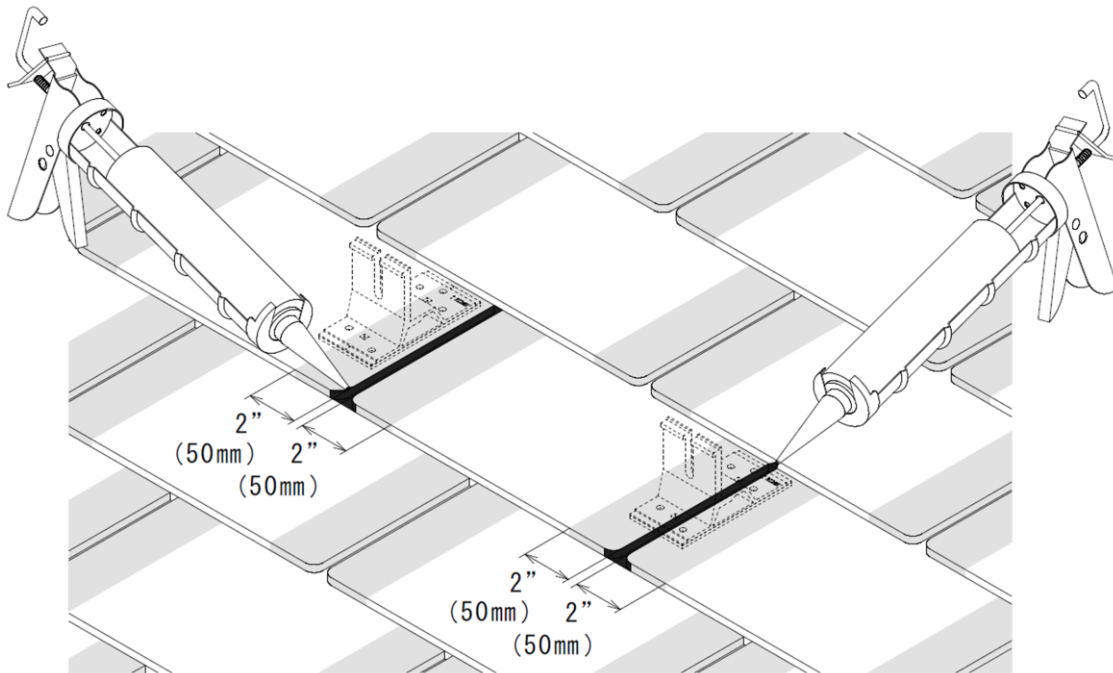
The minimum gap between the screw 5.0×60 and the edge of the slate should be 2" (50 mm).



※Installation not possible

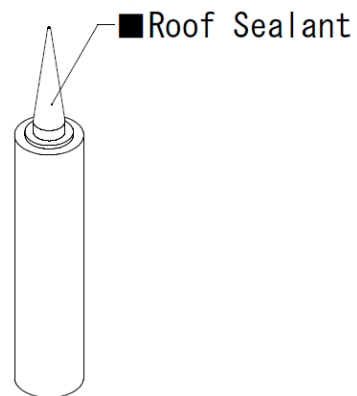
**!** Attention

If you are installing the RT-PLUS within 2 inches (50 mm) of a roof gap, you will need to fill the gap with sealant or butyl as shown below.



**【Roof sealant recommended products】**

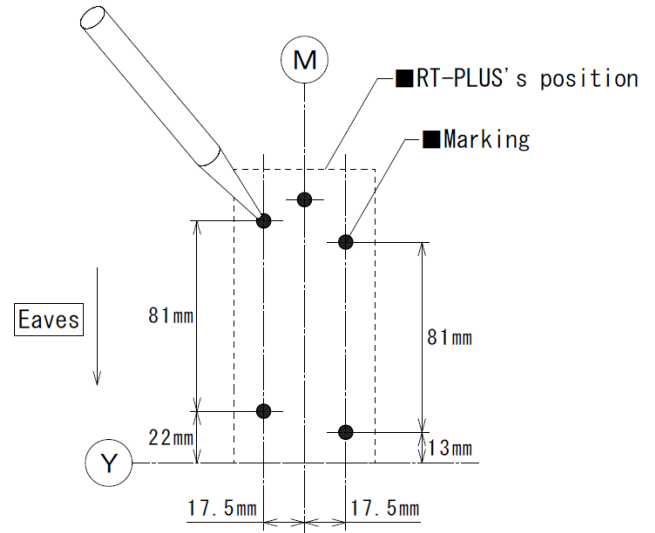
- Henry : 208R, 209, 925 (Black)
- Geocel:S2, S4 (Black)
- Sashco : Through the Roof
- Boss : 125 (Black)
- Top Industrial: Rain Buster 850, 900
- Chem Link: M1
- NPC Solar Seal 900
- GE All Purpose 100% Silicone



① Chalk vertical line (M-line) and horizontal line (Y-line) according to the layout plan to indicate the position for the RT-PLUS position.

- ( i ) M-line: Center of RT-PLUS
- ( ii ) Y-line: Edge of RT-PLUS

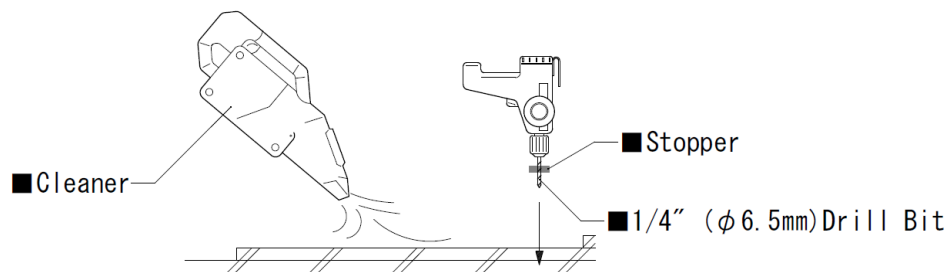
② Mark the position as shown on right.  
 ※Only for deck mounting.



### Attention

Note: Marking spot is not symmetrical. When the RT-PLUS is installed on the metal roof, you may want to have an extra RT-PLUS to assist in marking on a metal roof. (Create a RT-PLUS JIG by removing the RT Butyl from it.)

③ Drill a pilot hole of  $\phi 1/4$  ( $\phi 6.5$  mm) at the installation position.



Caution: A drill bit stop can help you control the depth you drill. Always use the stop to drill only through the roofing layer, not through the decking or underlayment.

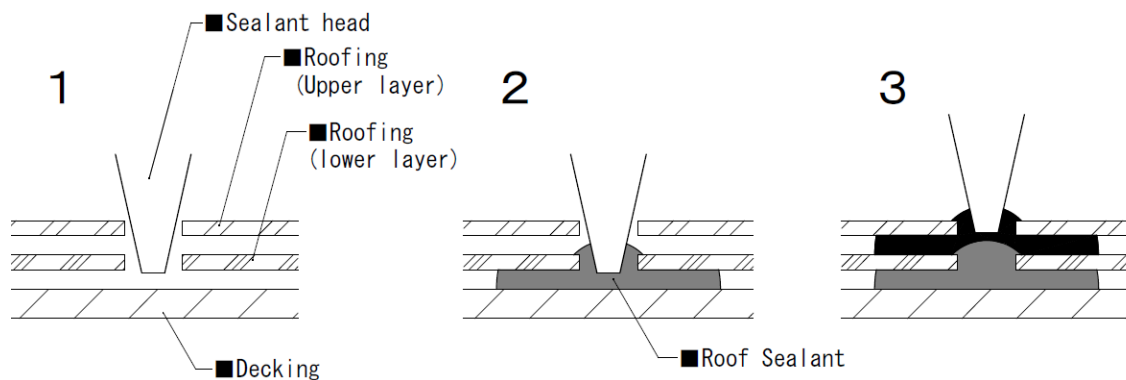


## Attention

Drilling into the wood underneath should be avoided.

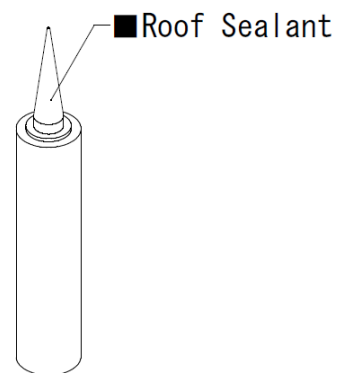
④ Fill the cavity with sealant.

\* Make sure the sealant is at the same height as the slate surface.

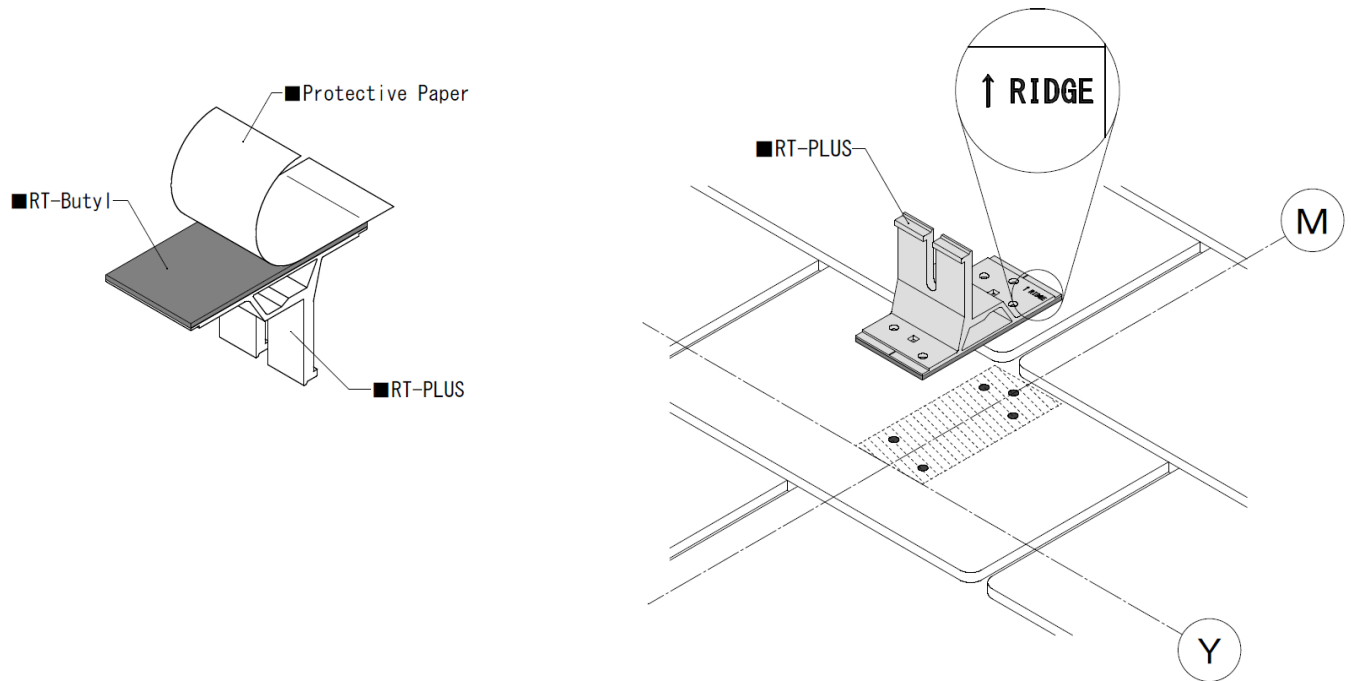


### 【Roof sealant recommended products】

- Henry : 208R, 209, 925 (Black)
- Geocel: S2, S4 (Black)
- Sashco : Through the Roof
- Boss : 125 (Black)
- Top Industrial: Rain Buster 850, 900
- Chem Link: M1
- NPC Solar Seal 900
- GE All Purpose 100% Silicone



- ⑤ Remove the protective paper under the RT-PLUS and place it on specified chalk line. Place 『↑RIDGE』 on the ridge side.



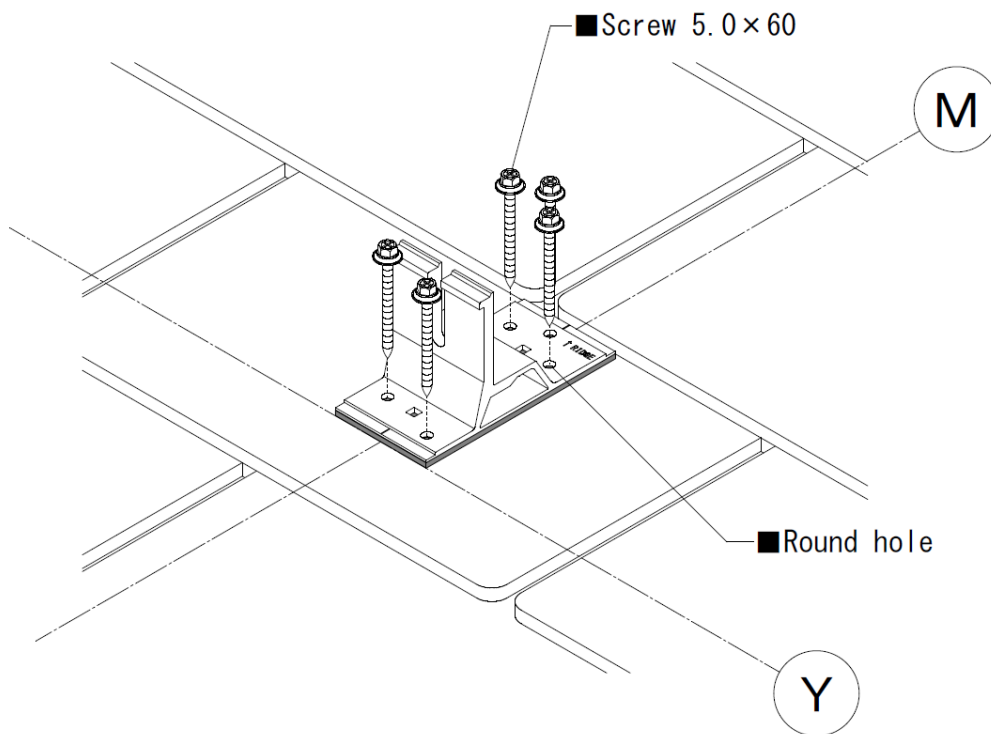
**! Attention**

Do not leave any protective paper on the surface of the RT butyl tape, it can cause an improper seal and may allow water intrusion under the bracket.

**! Attention**

To maintain butyl performance, avoid installation when ambient temperature is below 22 °F (-5°C) or above 176 °F. (80°C).

- ⑥ Drive the screw 5.0×60 while holding the RT-PLUS.  
Use the round holes on the RT-PLUS.  
Use five wood screws.



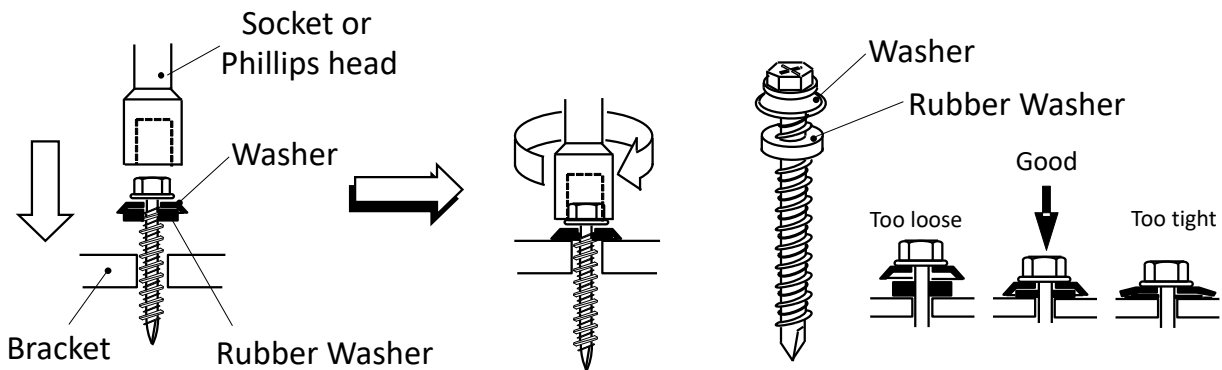
か

**!** Attention

Each RT-PLUS is shipped with 2 mounting screws per set.  
The installer must purchase additional screws when mounting it to the roof deck.

**! Attention**

**Note:** Proper torque values for the screw 5.0×60 will vary depending on the rafter and/or deck characteristics; hardness, age, and moisture of the wood. It should be tightened until the conical washer stops rotating.



**When tightening the screws please tighten all screws equally and avoid using an impact driver as it can over torque the screws or even snap off the head**

- ⑦ Make sure the RT-PLUS is securely fixed

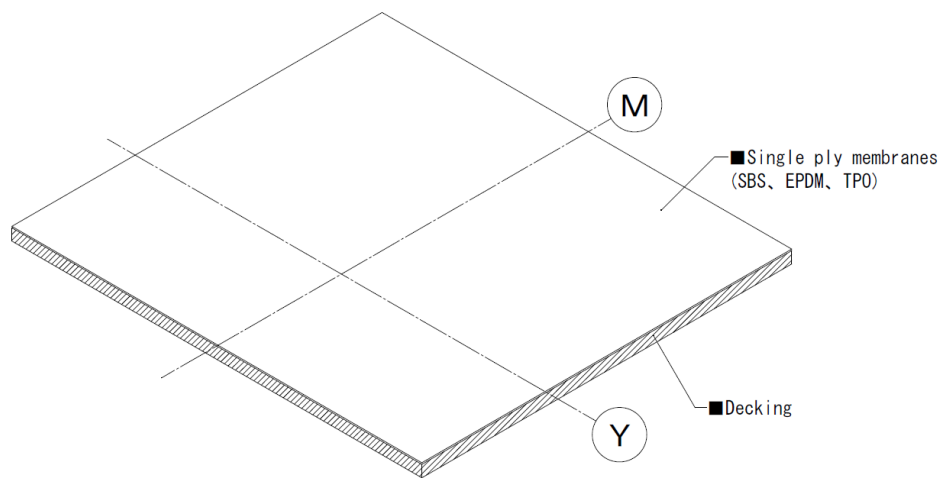
## 5. Installation on Membrane Roof

Can be installed on SBS, TPO, and EPDM roofing materials.

① Chalk a vertical line (M-line) and a horizontal line (Y-line) according to the layout plan to indicate the position for the RT-PLUS position.

(i) M-line : Center of RT-PLUS

(ii) Y-line : Edge of RT-PLUS

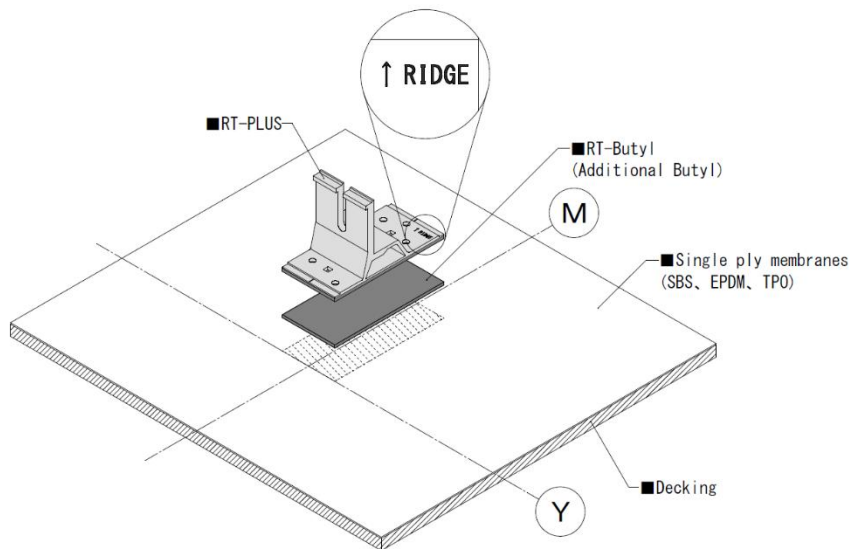


- ② Remove the protective papers under the additional Butyl (sold separately) and RT-PLUS and place them on specified chalk line. Place, 『↑RIDGE』 on the ridge side



**! Attention**

Do not leave any protective paper on the surface of the RT butyl tape, it can cause an improper seal and may allow water intrusion under the bracket.



**! Attention**

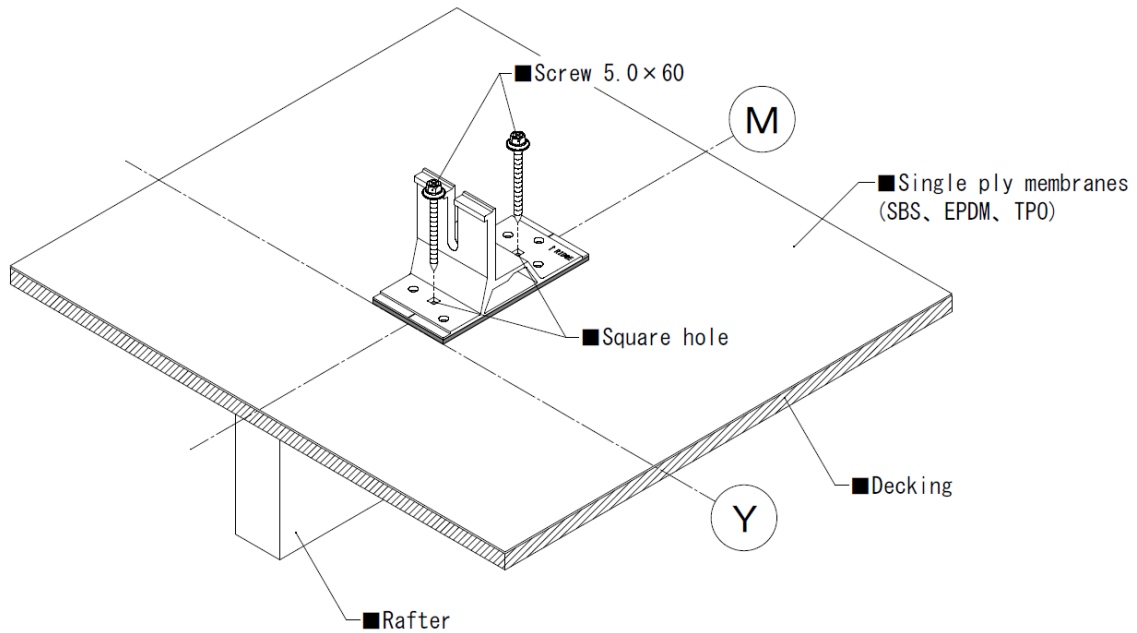
To maintain butyl performance, avoid installation when ambient temperature is below 22 °F (-5°C) or above 176 °F. (80°C).

- ③ Drive the screw 5.0×60 while holding the RT-PLUS.

## Rafter Mounting

Mount the RT-PLUS using the square holes.

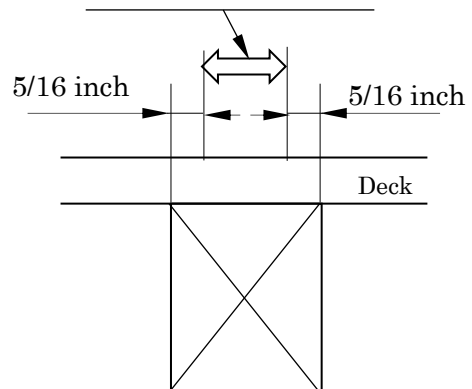
Use two wood screws.



### ! Attention

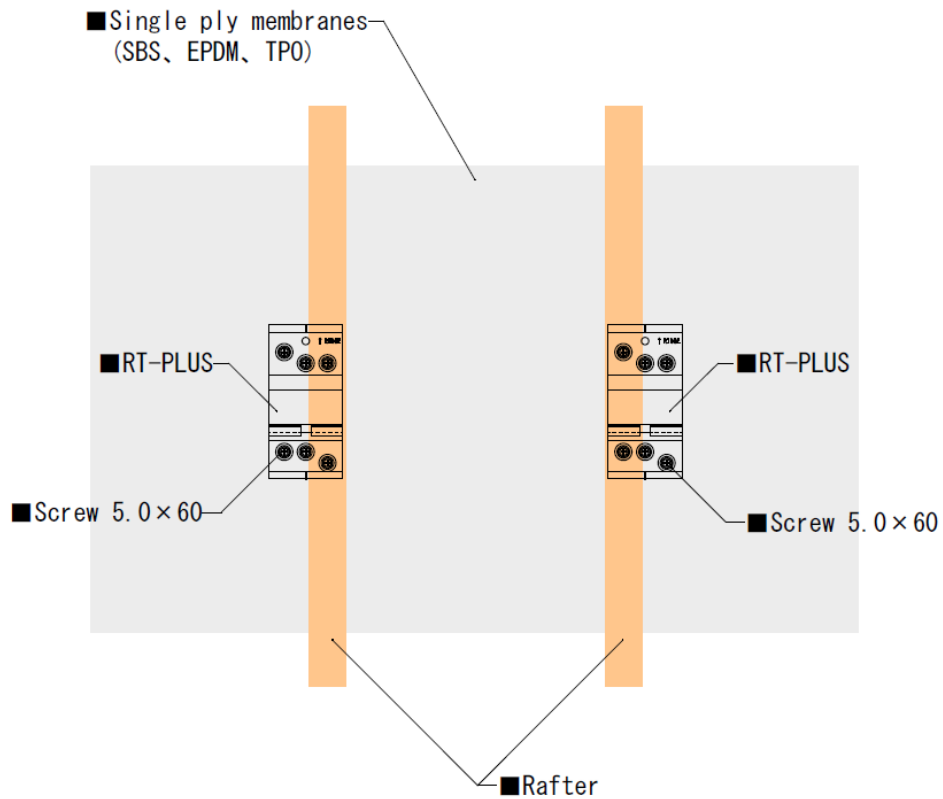
The wood screw must clear 5/16" from each edge of the rafter.

The mounting screw shall hit this area.



If you miss screwing the rafters, please use off set screw positions as below using six wood screws.

Please refer to the PE Stamped Letters for maximum span adjustment.

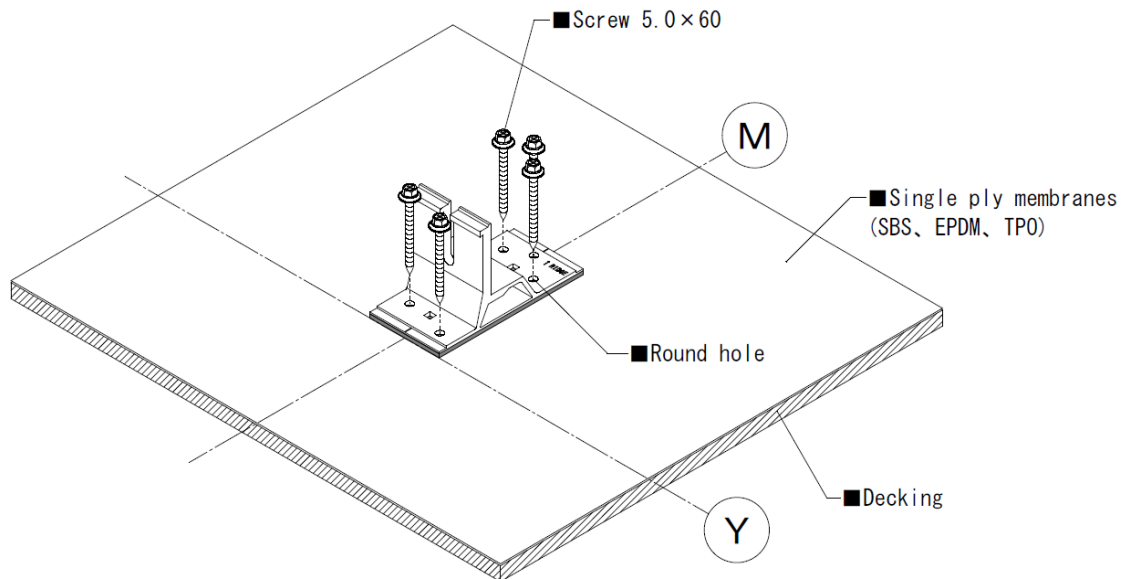


## Deck Mounting

Drive the screw 5.0×60 while holding the RT-PLUS.

Use the round holes on the RT-PLUS.

Use five wood screws.

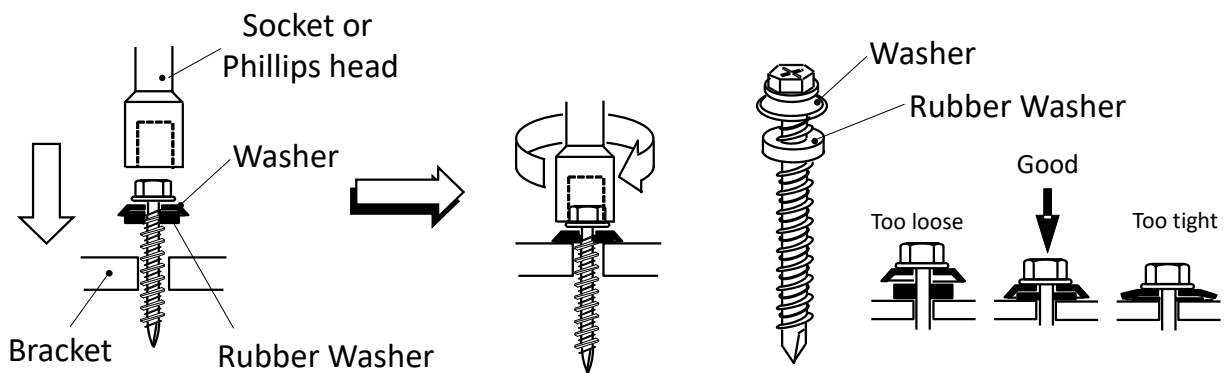


### Attention

Each RT-PLUS is shipped with 2 mounting screws per set. The installer must purchase additional screws when mounting it to the roof deck.

**! Attention**

**Note:** Proper torque values for the 5.0×60 mm screw will vary depending on the rafter and/or deck characteristics; hardness, age, and moisture of the wood. It should be tightened until the conical washer stops rotating.



**When tightening the screws please tighten all screws equally and avoid using an impact driver as it can over torque the screws or even snap off the head.**

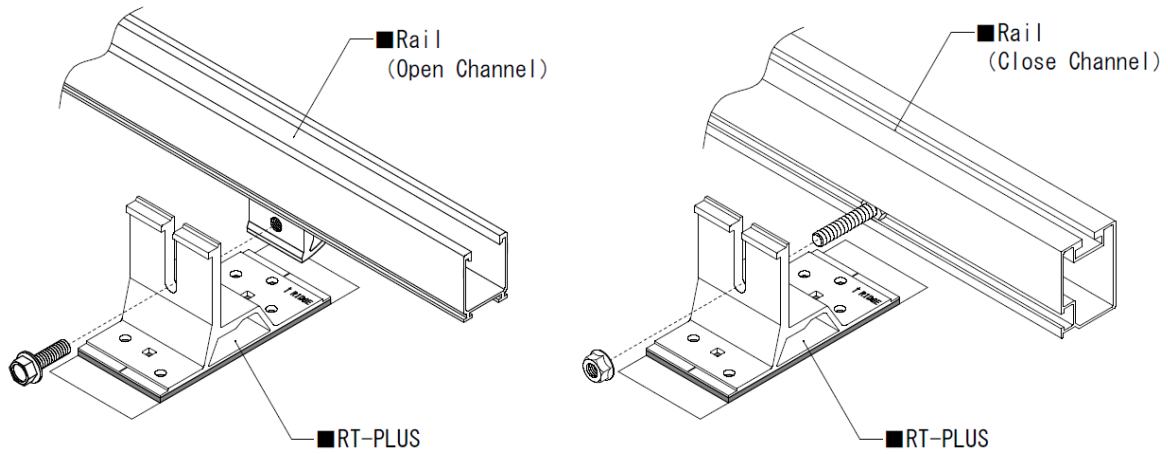
- ④ Make sure the RT-PLUS is securely fixed



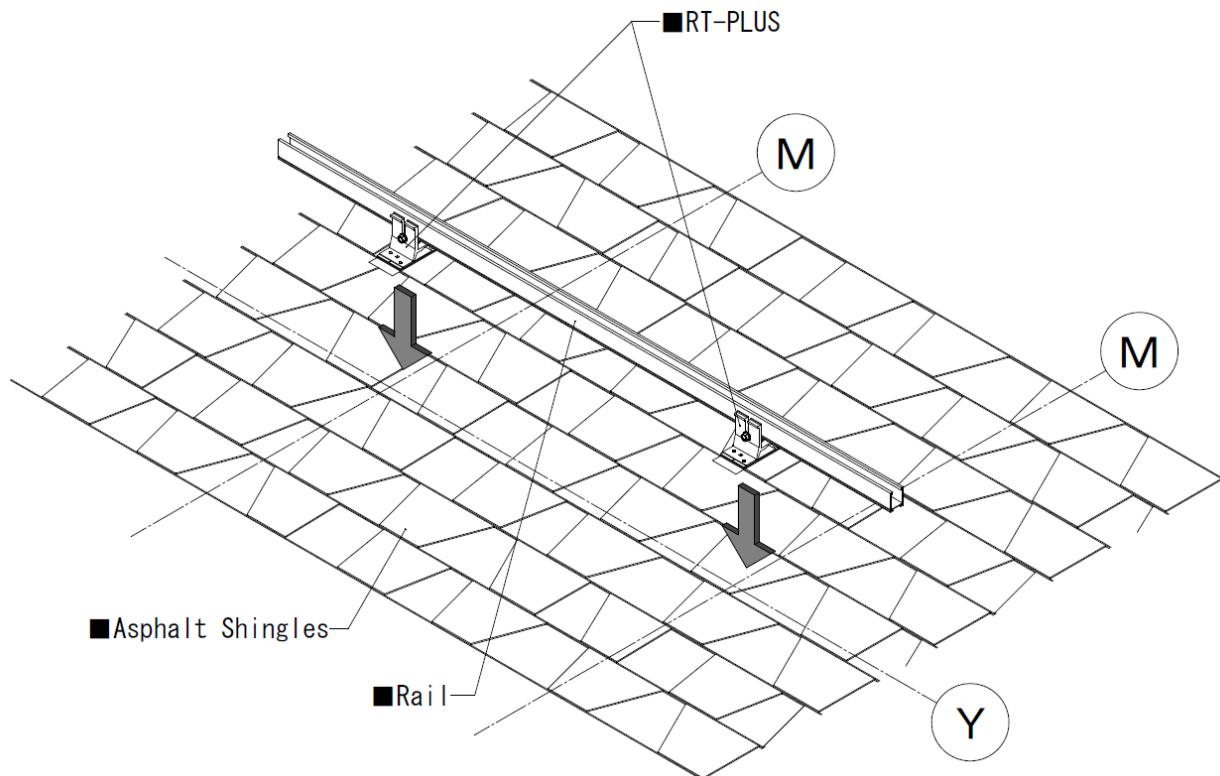
## Asphalt Shingles Roof Installation (Alternate Method)

3/8 in (10 mm).

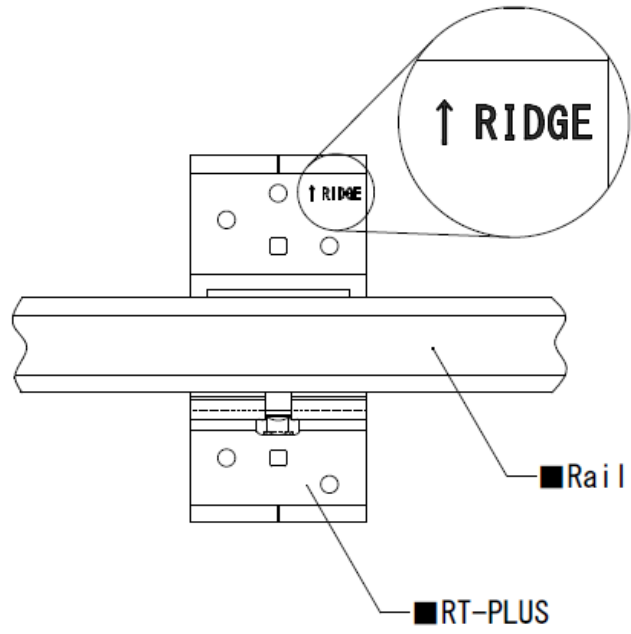
- ② Pre-attach a rail or rail support bracket to the RT-PLUS. Please attach the rail on the ground.



- ③ Take the rail with the RT-PLUS attached to it onto the roof and align the RT-PLUS with the chalk line.

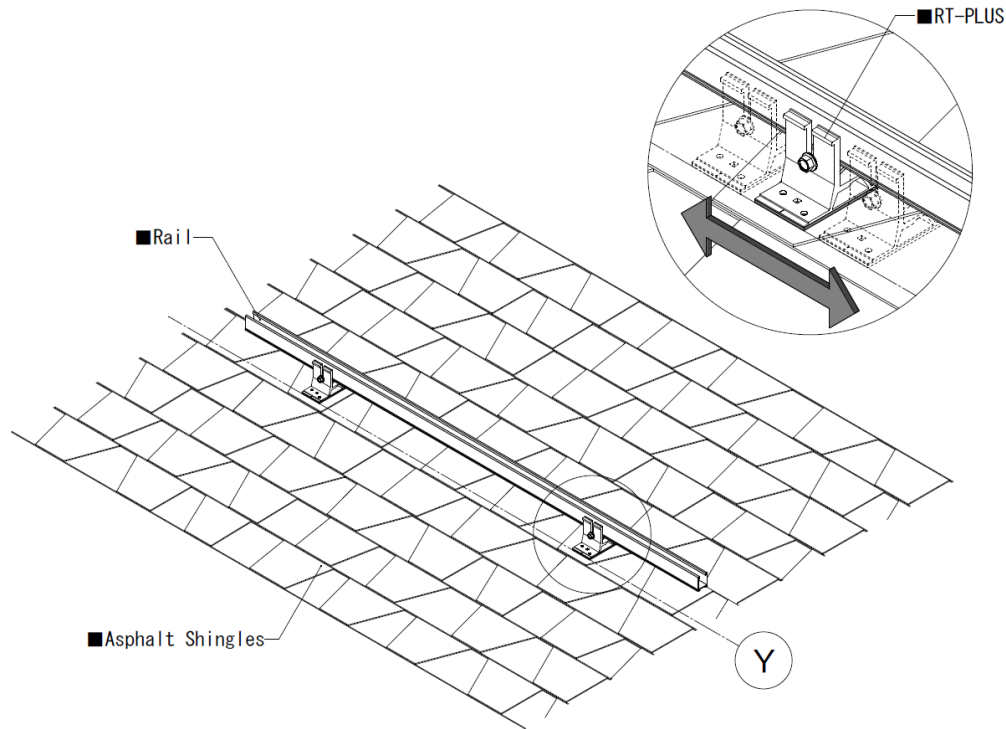


“↑RIDGE” is on the ridge side.



## Asphalt Shingles Roof Installation (Alternate Method)

- ④ Move the RT-PLUS to a flat surface of the asphalt shingles roof. Follow the span distance according to the PE Stamped letters.



- ⑤ Peel off the protective paper and paste it on the roof's surface.



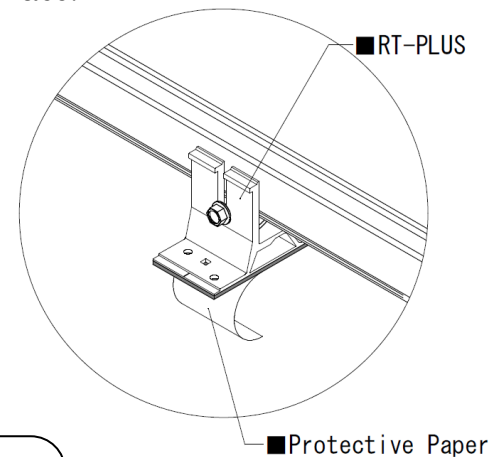
### Attention

Do not leave any protective paper on the surface of the RT butyl tape, it can cause an improper seal and may allow water intrusion under the bracket.



### Attention

To maintain butyl performance, avoid installation when ambient temperature is below 22 °F (-5°C) or above 176 °F. (80°C).

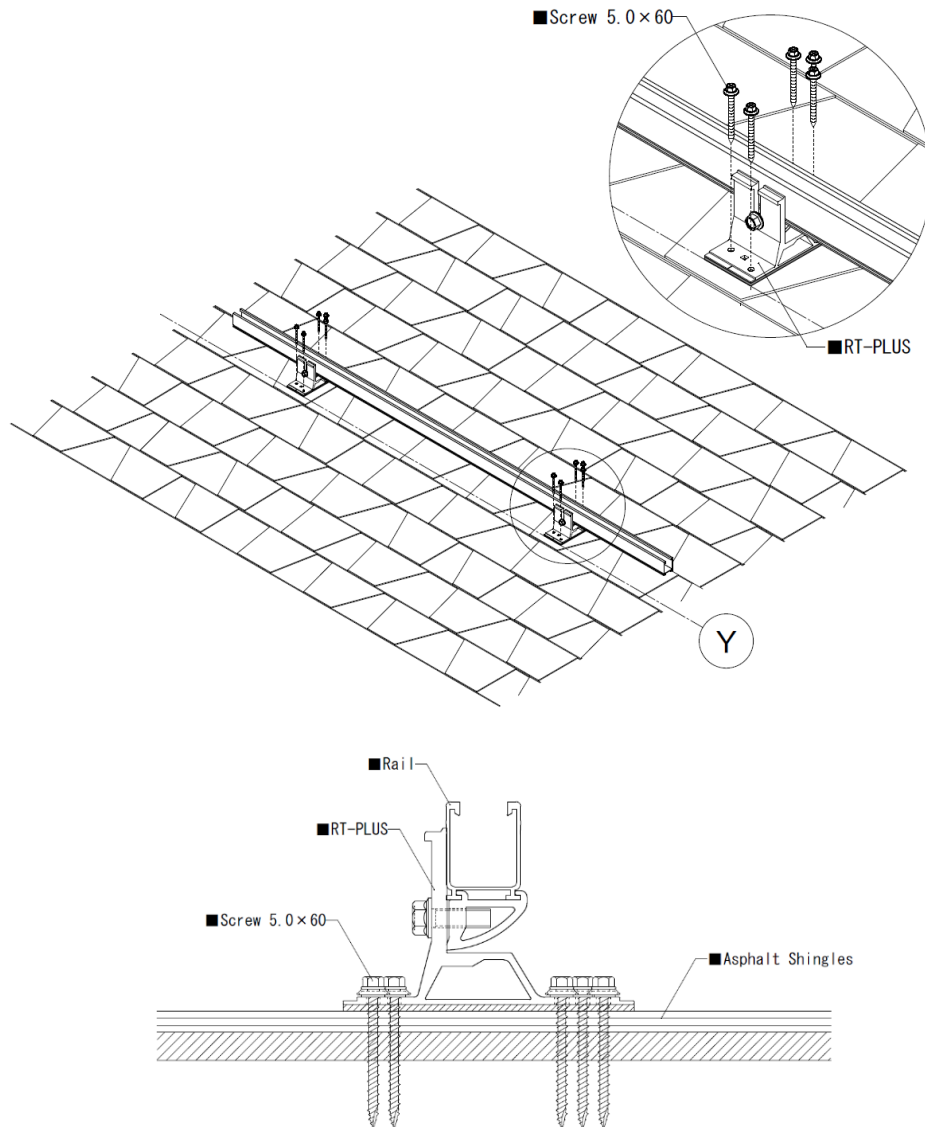


## Asphalt Shingles Roof Installation (Alternate Method)

③ Secure the RT-PLUS with screw 5.0×60.

Please use the round hole of the RT-PLUS. Use 5 wood screws.

\* Use a long bit socket

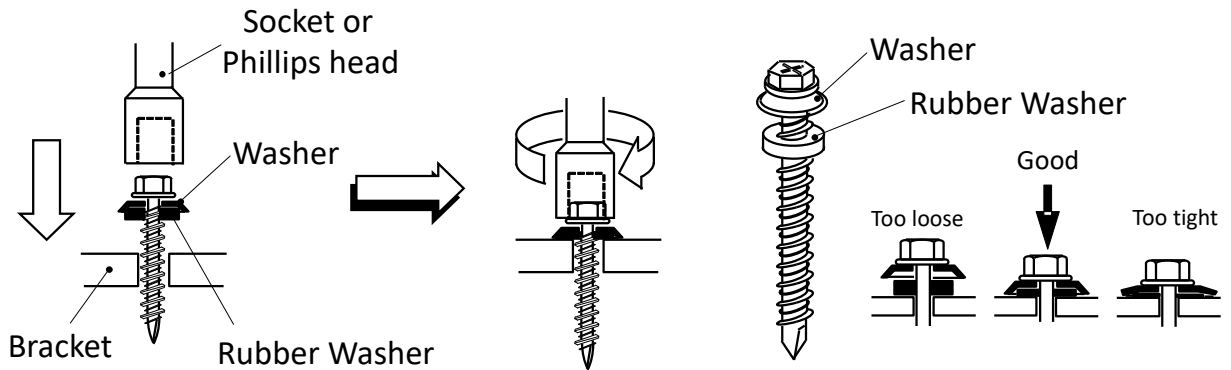


### Attention

The RT-PLUS set includes two wood screws for each set. If you want to attach it to a roof decking, you will need to purchase additional wood screws.

**! Attention**

The appropriate torque value for 5.0 x 60 screws depends on the characteristics of the rafter and deck (wood hardness, age, moisture, etc.). Tighten until the conical washer stops rotating.



When tightening screws, tighten all screws evenly and avoid using an impact driver.

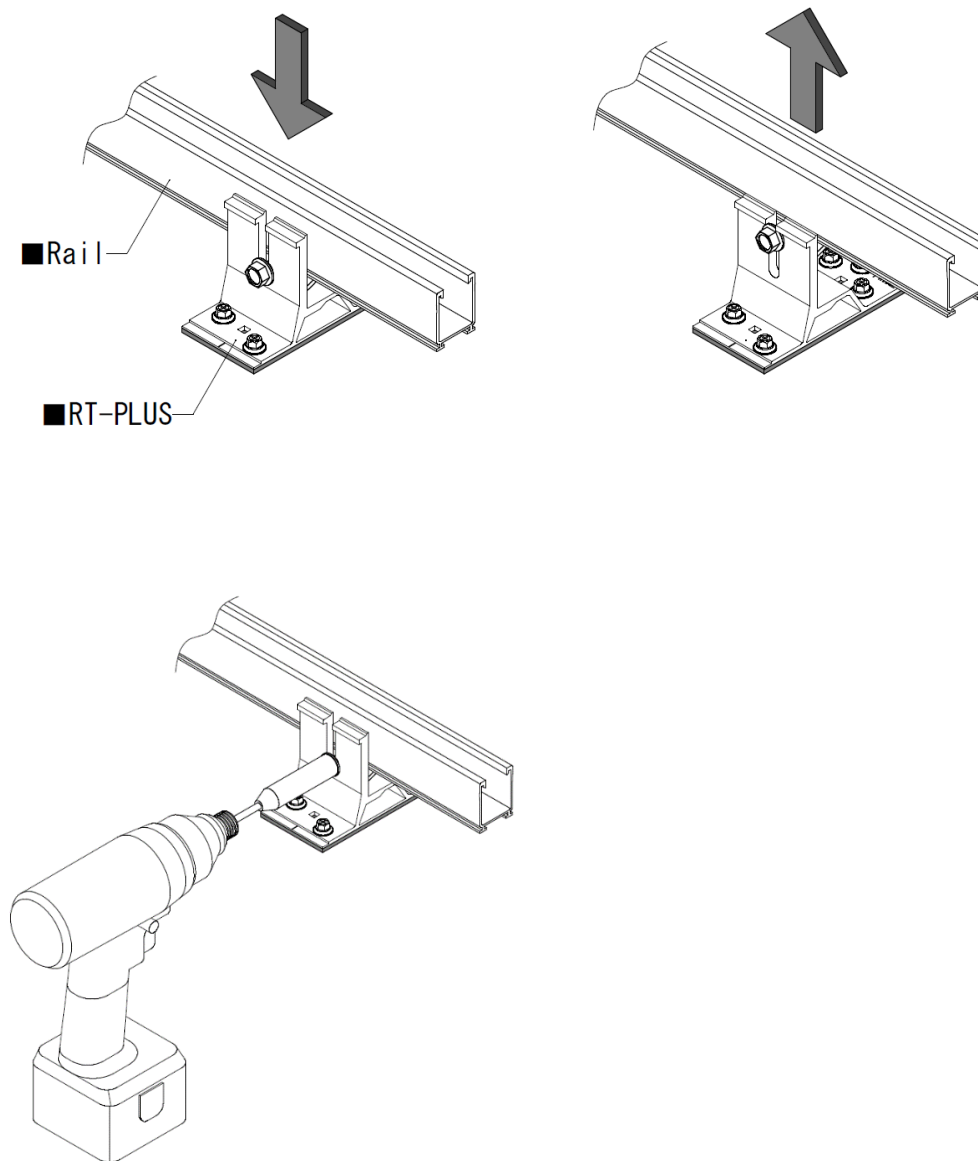
- ⑦ Make sure the RT-PLUS is securely fixed. □

- ⑧ Adjust the height and secure the rail.

Follow tightening torque on the rail manufacturer's installation manual.

If installed with the RT-Rail, apply 12 lb-ft of torque to the 5/16" bolt.

If not specified by the rail manufacturer, Roof Tech recommends a minimum of 12 lb-ft on a 5/16 Bolt and 18 lb-ft on a 3/8" bolt.



## LIST OF COMPATIBLE RAIL SYSTEMS:

### US

RT Rail, K2 (Everest) Cross Rail, Single Rail, & Solid Rail, Ironridge XR series & Aire series, UNIRAC SM & NXT, Tamarack FM Rail, Chiko Rails, ProSolar Roof Trac, SnapNrack Ultra Rail, SunModo SMR, EcoFasten Click Fit Rail, Pegasus Rail & Max Rail.

### Canada

HB International Inc SkyRack, Clenergy PV-ezRack, Kinectic Solar Rail, SL Rack Rail 35 and Rail 40 (MINI II Only) ,Fast Rack Ultra. Schletter Rail Pro 35, 50 & 70 (MINI II Only).

## Customer Support

For assistance call Roof Tech customer support.

(858) 935-6064

<http://roof-tech.us/>

