



# GRASOL PITCHED ROOF RACKING SYSTEM

## SLOPE ROOF

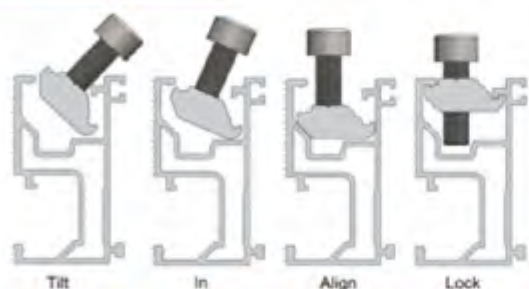
Grasol Pitched Roof designs with great flexibility both for commercial and residential roof solar system, suitable for installing framed and frameless modules flushed to the pitched roof. Special extruded Aluminum rail, pre-assembled clamps and varied roof hooks or brackets with tilt-in module ensure easy and quick installation, saving your labor time and cost. Besides, the customized length of rail will not require onsite weld and cut, keeping the appearance entirety, structural strength and anticorrosive performance.



## TECHNICAL INFORMATION

- Install site:** Pitched Roof
- Tilt Angle:** Flushed with the roof up to 60deg
- Building Height:** up to 20m
- Max Wind Speed:** up to 60m/s
- Snow Load:** up to 1.4KN/m<sup>2</sup>
- Standard:** AS/NZS 1170 and other international Standard
- Material:** High Class Aluminum alloy  
Stainless steel
- Color:** Natural
- Anticorrosive:** Anodized
- Warranty:** Ten years warranty
- Duration:** More than 20 years

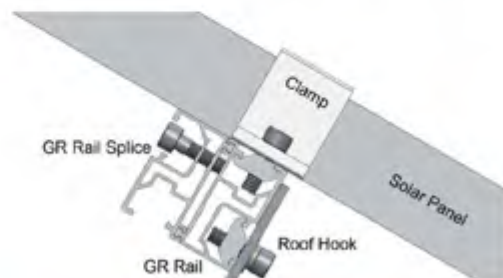
## ASSEMBLY FIGURE



Four Steps to put the tilt-in module into rail easily

## BENEFITS

- Easy Installation:** the tilt-in module can be put into the extruded rail from any section and can be pre-assembled with the clamp and roof hook, minimizing time and cost of installation.
- Flexibility and Adjustable:** these systems accommodate most commercially available framed or frameless solar panels and diverse roof types.
- Safety and Reliability:** The racking systems can stand up to the extreme weather complied with the AS/NZS 1170 and other international structure load standards by skilled engineers. The main support components have also



Assembly drawing

## COMPONENTS

### Grasol Rail

#### Features

- Material: Al6005-T5
- Extruded Aluminum Section
- High Class Anodized Aluminum
- Color: Natural

Package: 8 Pcs/ package

Item No.	Description
<b>Standard</b>	
GR-R-2560	GR Rail with a standard length of 2560 mm Designed to mount 3 modules ( width 808~826mm)
GR-R-3405	GR Rail with a standard length of 3405 mm Designed to mount 4 modules ( width 808~826mm)
GR-R-4200	GR Rail with a standard length of 4200 mm Designed to mount 4 modules ( width 990~996mm)
<b>Customized Length</b>	
GR-R	GR Rail with a customized length



GR-R



### Rail Splice Kit

#### Features

- Material: Al6005-T5 & A2-70 bolt
- Connect two pieces GR rail
- Color: Natural

Package: 15Pcs/Box 4Boxes/CTN

Item No.	Description
GR-R-SP	GR standard rail splice kit



GR-R-SP



## COMPONENTS

### Framed Module Clamps

#### Features

- Material: Al6005-T5 & A2-70 stainless steel bolt
- Pre-assembly to compatible with the most Framed Module
- Include the Inter Clamp and End Clamp
- Color: Natural

Package: 100Pcs/Box 4Boxes/CTN

#### Inter Clamp Kit

Item No.	Description
GR-IC-F30	Grace Solar Inter Clamp Kit 30mm
GR-IC-F35	Grace Solar Inter Clamp Kit 35mm
GR-IC-F40	Grace Solar Inter Clamp Kit 40mm
GR-IC-F46	Grace Solar Inter Clamp Kit 46mm
GR-IC-F50	Grace Solar Inter Clamp Kit 50mm
GR-IC-F57	Grace Solar Inter Clamp Kit 57mm



GR-IC-F

#### End Clamp Kit

Item No.	Description
GR-EC-F30	Grace Solar End Clamp Kit 30mm
GR-EC-F35	Grace Solar End Clamp Kit 35mm
GR-EC-F40	Grace Solar End Clamp Kit 40mm
GR-EC-F46	Grace Solar End Clamp Kit 46mm
GR-EC-F50	Grace Solar End Clamp Kit 50mm
GR-EC-F57	Grace Solar End Clamp Kit 57mm



GR-EC-F

## COMPONENTS

### Framed Module Clamps

Item No.	Description
GR-IC-L80	Thin Film Module Inter Clamp



GR-IC-L80

#### Features

- Material: Anodized Al6005-T5
- Fix the thin film module with thickness 6~10mm
- Pre-assembly with Rubber Pad and Stainless Steel Fastener
- Color: Natural

Item No.	Description
GR-EC-L80	Thin Film Module Inter Clamp



GR-EC-L80

#### Features

- Material: Anodized Al6005-T5
- Fix the thin film module with thickness 6~10mm
- Pre-assembly with Rubber Pad and Stainless Steel Fastener
- Color: Natural

Item No.	Description
GR-CC-40	Rails Cross-Connector



GR-CC-40

#### Features

- Material: Anodized Al6005-T5
- Pre-assembly with Stainless Steel Fastener
- Color: Natural

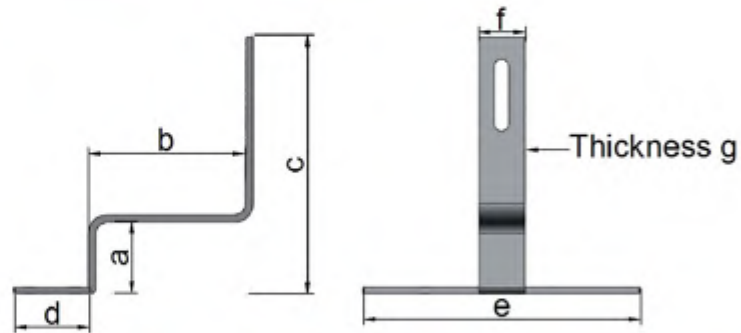


# COMPONENTS

## Tile Roof Hook

### Features

- Material: Stainless steel 304 & A2-70 bolt
- Pre-assembly with the tilt-in module
- Various types to meet the difference roof
- Chosed according to the weather condition



Dimension Drawing For the Charts

Item No.	Description
GR-IK-01	Stainless Steel Hook 1# -Fix rails to Roman tile roof -For low Snow loads and normal wind load

Dimension Chart							
	a	b	c	d	e	f	g
mm	46	101	166	50	180	30	5

Package: 40PCS/CTN



GR-IK-01

GR-IK-02	Stainless Steel Hook 2# -Fix rails to Flat tile roof -For low Snow loads and normal wind load
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	a	b	c	d	e	f	g
mm	30	190	166	80	30	30	5

Package: 60PCS/CTN



GR-IK-02

GR-IK-03	Stainless Steel Hook 3# -Fix rails to Roman tile roof -For low Snow loads and normal wind load
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	a	b	c	d	e	f	g
mm	30	101	166	50	30	30	5

Package: 24PCS/CTN



GR-IK-03

# COMPONENTS

Item No.	Description
GR-IK-04	Stainless Steel Hook 4# -Fix rails to Slate tile roof -For low Snow loads and normal wind load

	Length	Height	Width	Thickness
mm	200	120	30	5

Package: 80PCS/CTN



GR-IK-04

GR-IK-06	Stainless Steel Hook 6# -Fix rails to Roman tile roof -For low Snow loads and normal wind load
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	a	b	c	d	e	f	g
mm	46	70	166	50	180	30	5

Package: 40PCS/CTN



GR-IK-06

GR-IK-09	Stainless Steel Hook 9# -Fix rails to Roman tile roof -For the heavy snow load
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	a	b	c	d	e	f	g
mm	46	111	200	60	180	35	8

Package: 20PCS/CTN



GR-IK-09

GR-IK-12	Adjustable Stainless Steel Hook 12# -Top fix rails to Roman tile roof -For the low snow load and normal wind load
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	a	b	c	d	e	f	g
mm	38~50	101	158~170	55	140	30	5

Package: 40PCS/CTN



GR-IK-12



## COMPONENTS

### Tile Roof Hook

Item No.	Description
GR-IK-02-A	Stainless Steel Hook 2# A type -Side fix rails to Flat tile roof -For low Snow loads and normal wind load

#### Dimension Chart

	a	b	c	d	e	f	g
mm	30	190	166	80	30	30	5

Package: 60PCS/CTN



GR-IK-02-A

Item No.	Description
GR-IK-04-A	Stainless Steel Hook 4# A type -Side fix rails to Slate tile roof -For low Snow loads and normal wind load

	Length	Height	Width	Thickness
mm	200	120	30	5

Package: 80PCS/CTN



GR-IK-04-A

Item No.	Description
GR-IK-AP01	Stainless Steel Hook Side Adjust Plate 1# -Cooperated with hook to side fix with rafter -For low Snow loads and normal wind load

	Length	Height	Width	Thickness
mm	90	90	50	4

Package: 24PCS/CTN



GR-IK-AP01

## COMPONENTS

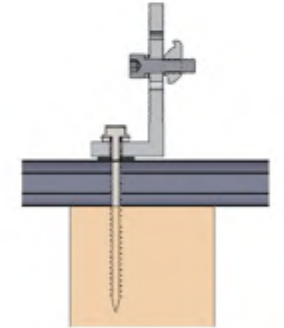
### Corrugated Roof Hook

#### Features

- Material: Al6005-T5 & A2-70 bolt
- Extruded Aluminum Section
- Pre-assembly with the tilt-in module
- Color: Natural

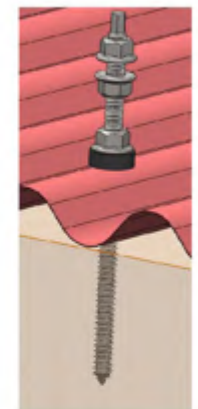
Item No.	Description
GR-IK-05	Aluminum Tin Interface Kit 5# -Fix rails to tin roof -Fixation by a wood screw M6x80

Package: 200PCS/CTN



GR-IK-05

GR-IK-H01	Hanger Bolt Hook 1# -Suitable for GR Rail -M10x200 hanger bolt kit with angle plate kit
GR-IK-H02	Hanger Bolt Hook 2# -Suitable for GR Rail -M12x200 hanger bolt kit with angle plate kit
GR-IK-H03	Hanger Bolt Hook 3# -Suitable for GR Rail -M12x300 hanger bolt kit with angle plate kit
GR-IK-H04	Hanger Bolt Hook 4# -Suitable for GR Rail -M10x200 hanger bolt kit with L feet kit



GR-IK-H01  
GR-IK-H02  
GR-IK-H03



GR-IK-H04



# COMPONENTS

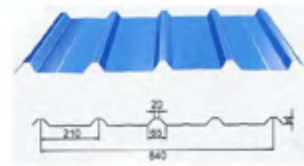
## Sheet Metal Roof Hook

### Features

- Material: Al6005-T5 & stainless steel 304 & A2-70 bolt
- Pre-assembly with the tilt-in module
- Customized according to the section parameter of the sheet metal roof.

Package: 160PCS/CTN

Item No.	Description
GR-IK-07	Stainless Steel Hook 7#
GR-IK-07-A	Stainless Steel Hook 7# A type
GR-IK-07-B	Stainless Steel Hook 7# B type



Trapezoid Roof Size

Note: Standard product is just fitted with the trapezoid roof as right figure shown other size must consider the mould cost



GR-IK-07



GR-IK-07-A



GR-IK-07-B



Parallel



Vertical



Both

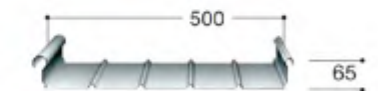
# COMPONENTS

## Standing Seam Roof Hook

Item No.	Description
GR-IK-S01	Standing Seam Roof Hook 1# -Suitable for Butler roof
GR-IK-S02	Standing Seam Roof Hook 2# -Suitable for KalZip- Bemo-roofs
GR-IK-S03	Standing Seam Roof Hook 3# -Suitable for Zambelli RibRoof Speed 500
GR-IK-S04	Standing Seam Roof Hook 4# -Suitable for Butler roof
GR-IK-SK7	Standing Seam Roof Hook K7 -Suitable for Klip-Lok 700
GR-IK-S02-A	Standing Seam Roof Hook 2# A type, -Suitable for KalZip- Bemo-roofs -Length 80mm
GR-IK-S03-A	Standing Seam Roof Hook 3# A type, -Suitable for Butler roof -Length 80 mm
GR-IK-SK7-A	Standing Seam Roof Hook K7 A type -Suitable for Klip-Lok 700 -Length 80mm



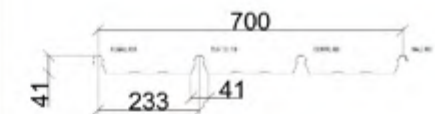
Butler-roof



KalZip-roof



Zambelli Rib Roof Speed 500



Klip-lok 700



GR-IK-S01



GR-IK-S02



GR-IK-S03



GR-IK-SK7



GR-IK-S04



GR-IK-S02-A



GR-IK-S03-A



GR-IK-SK7-A



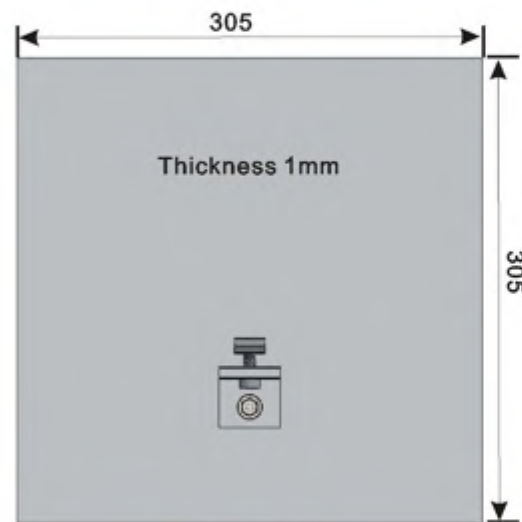
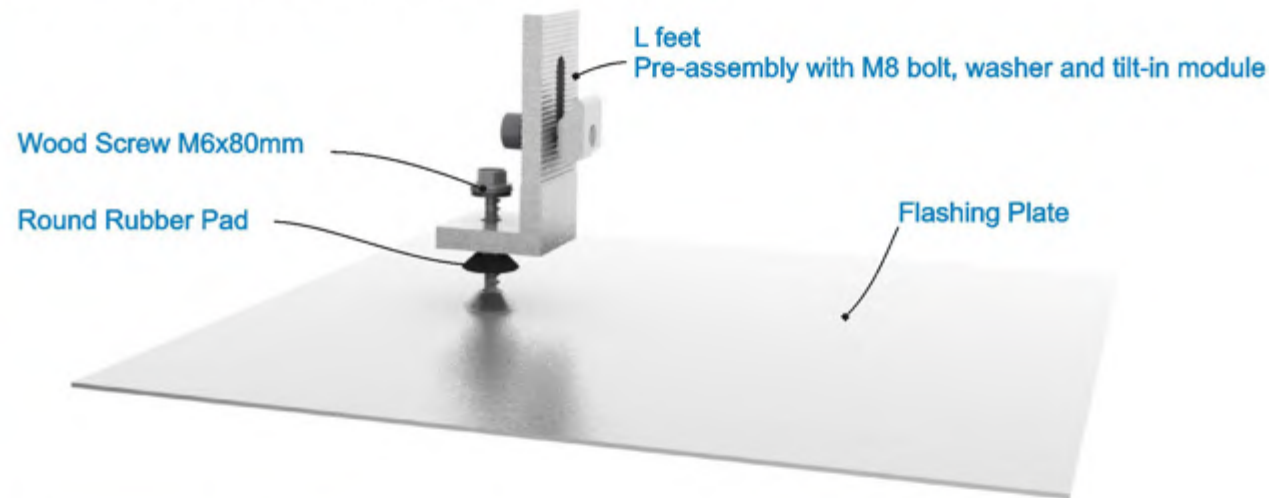
## COMPONENTS

### Flashing Hook

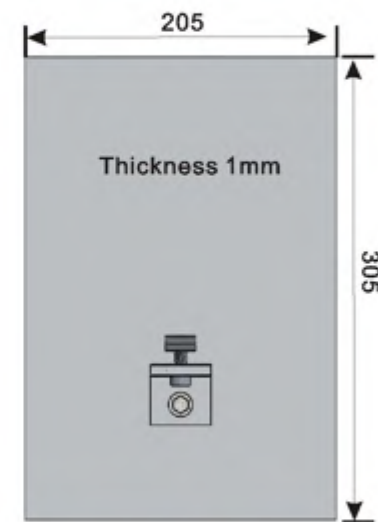
Item No.	Description
GR-FK-01	Shingle Roof Flashing Hook, 305x305x1mm
GR-FK-02	Shingle Roof Flashing Hook, 305x205x1mm

#### Features

- All-in-one waterproof flashing and mount to anchor photovoltaic racking systems
- Made of all aluminum and includes stainless steel hardware
- Installs seamlessly and saves labor by not needing to cut away any roofing
- Fit with in most composition and wood shingle roof systems



GR-FK-01



GR-FK-02

## COMPONENTS

### High-Rise Flashing

Item No.	Description
GR-HR-150	High-Rise Bar, Height is 150mm -Height can be customized
GR-HF-01	High-Rise Flashing1#, 305x205x1mm

#### Features

- Made of all aluminum and includes stainless steel hardware
- Non-fading sealing collar
- Not for hot-mopped or built-up roofs
- Do not use paint or petroleum based products on rubber collars





## COMPONENTS

## COMPONENTS

### Accessories

#### Framed Clamp

GR-A-IC	Framed Module Inter Clamp
GR-A-EC30	Framed Module End Clamp 30
GR-A-EC35	Framed Module End Clamp 35
GR-A-EC40	Framed Module End Clamp 40
GR-A-EC46	Framed Module End Clamp 46
GR-A-EC50	Framed Module End Clamp 50
GR-A-EC57	Framed Module End Clamp 57



#### Module

GR-A-TM01	Tilt-in Module, -Width 20mm, M8 threaded hole
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### Fastener

#### Socket Head Screw-----Stainless Steel A2-70

GR-F-S820	Socket Head Screw M8x20
GR-F-S825	Socket Head Screw M8x25
GR-F-S828	Socket Head Screw M8x28
GR-F-S830	Socket Head Screw M8x30
GR-F-S835	Socket Head Screw M8x35
GR-F-S840	Socket Head Screw M8x40
GR-F-S845	Socket Head Screw M8x45
GR-F-S850	Socket Head Screw M8x50
GR-F-S855	Socket Head Screw M8x55
GR-F-S860	Socket Head Screw M8x60
GR-F-S865	Socket Head Screw M8x65
GR-F-S870	Socket Head Screw M8x70



#### Nut-----Stainless Steel A2-70

GR-F-N108	Hexagon Nut, M8
GR-F-N208	Flange Nut With Locking Teeth, M8
GR-F-N210	Flange Nut With Locking Teeth, M10
GR-F-N212	Flange Nut With Locking Teeth, M12



#### Washer-----Stainless Steel A2-70

GR-F-W108	Spring Washer, M8
GR-F-W208	Lock Washer, M8, OD13
GR-F-W308	Lock Washer, M8, OD18



#### Self-tapping Screw-----Stainless Steel 410

GR-F-T625	Self-tapping Screw, St6.3x25
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# COMPONENTS

## Screws and Accessories

### Wood Screw

GR-F-W680	Galvanized Wood Screw, St6.3x80 With Pad
GR-F-W808	Galvanized Wood Screw, M8x80 With Pad
GR-F-W010	Galvanized Wood Screw, M10x100 With Pad



### Hanger Bolt

GR-F-H020	Hanger Bolt M10x200 -Stainless Steel A2-70
GR-F-H220	Hanger Bolt M12x200 -Stainless Steel A2-70
GR-F-H230	Hanger Bolt M12x300 -Stainless Steel A2-70



### Hanger Bolt Assembly

#### Features

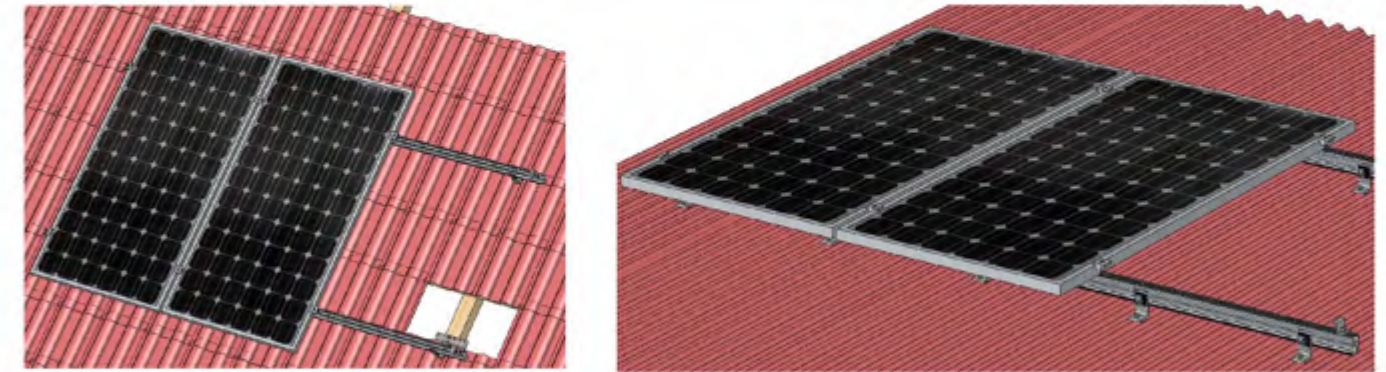
- Material: A2-70 bolt
- Incule 3 pcs Flange Nuts & Rubber Pad & Hanger Bolt
- Pre-assembly

GR-FA-H020	Hanger Bolt Assembly M10x200
GR-FA-H220	Hanger Bolt Assembly M12x200
GR-FA-H230	Hanger Bolt Assembly M12x300



# PROJECT EXAMPLE

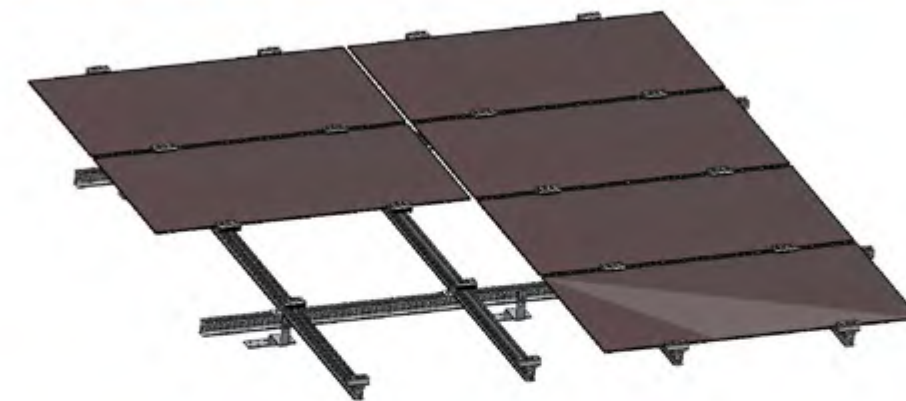
## Framed Module Project



Solar Panels Size: 1580*808*46mm or 1585*826*46mm	Rail GR-R-	Roof Hook GR-IK-01 (Tile) GR-IK-05 (Tin)	Inter Clamp GR-IC-F46	End Clamp GR-EC-F46	Rail Splice GR-R-SP
Tile Roof 3 Panels	2560mm 2 pcs	6	4	4	2
Tile Roof 4 Panels	3405mm 2pcs	6	6	4	2
Tin Roof 3 Panels	2560mm 2 pcs	10	4	4	2
Tin Roof 4 Panels	3405mm 2 pcs	10	6	4	2

**Note:** The above planning is applicable to the low snow loads and normal wind loads.

## Frameless Module Project



Solar Panels Size: 1200*600*6.8mm	GS Rail Top Floor GR-R-2560	GS Rail Bottom Floor GR-R-2560	Thin Film Inter Clamp GR-IC-L80	Thin Film End Clamp GR-EC-L80	Rails Cross-Connector GR-CC-40	Roof Hook 1# GR-IK-01
Tile Roof 8 Panels Array 4x2	2560mm 4 pcs	2560mm 2 pcs	80mm 12 pcs	80mm 8 pcs	40mm 8 pcs	Thickness 5mm 6 pcs

**Note:** The above planning is applicable to the low snow loads and normal wind loads.



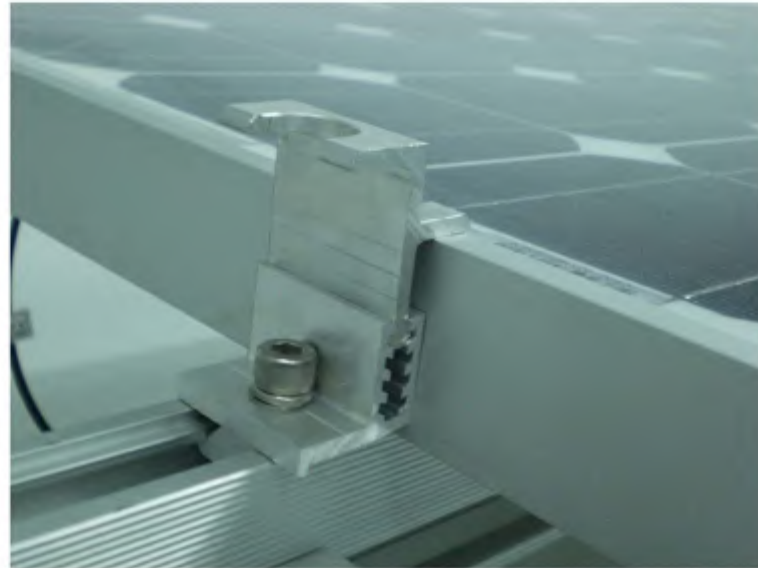
## ADJUSTABLE END CLAMP

### New Product

Grace Solar continues to bring innovation and better services to customers. For the varied thickness of framed modules, the adjustable end clamp is your choice. The component is used to fix the end side of the module. It is assembled by two aluminum parts, one of which can be inserted into the special ladder of the other one to shift the mount height from 25mm to 60mm.



Lowest



### Basic Information

Item No.	GR-EC-A40
Description	Adjustable End Clamp
Material	Aluminum Parts and Stainless Steel Fasten
Finish	Anodized
Width	40mm
Module Install	Module thickness between 25~60mm can be installed
Weight	0.088Kg/pcs
Package	50pcs in a box 4 boxes in a carton

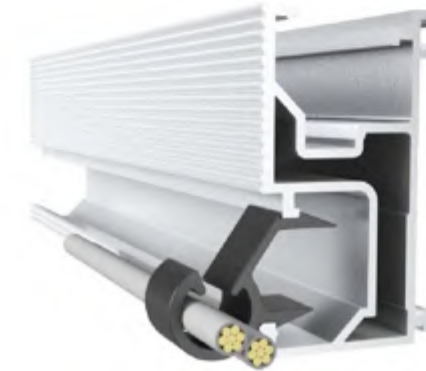


Highest

## PLASTIC CALBE CLIP

### New Product

Grasol Plastic Cable Clip can be mounted on the GR Rail easily to put the wire of modules. The clip is made of plastic with high performance in aging resistance and insurability. Easy-installing and removing design does not require any tools but hand and can be reused, unlike zip ties. The universal design fits most modules with holding one or two wires.



### Basic Information

Item No.	GR-A-PC01
Description	Plastic Cable Clip 1#
Material	Plastic
Weight	0.0022Kg
Wire Install	Universal



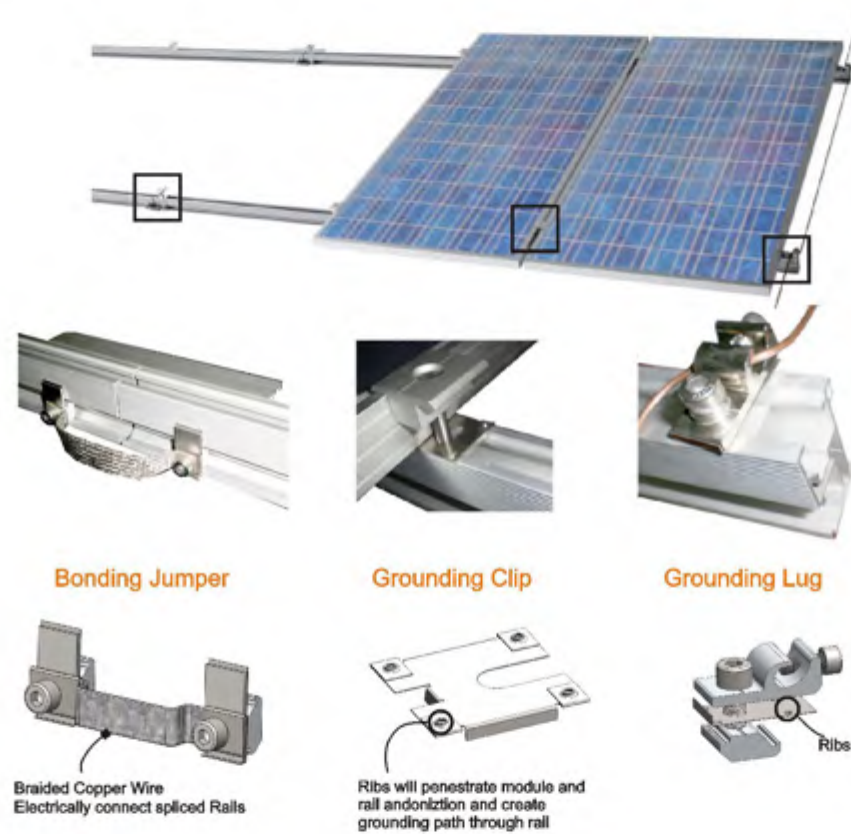


# GRASOL GROUNDING SYSTEM

# COMPONENTS

## GROUNDING

Grasol Grounding Product can be used to bond solar modules to the aluminum rails and the aluminum rails to ground, so that the entire solar system is grounded and safe; Grounding products include the stainless steel grounding clip and aluminum grounding lug, which are all designed to comply with the requirement of AS5033, UL467 for bonding or grounding systems.



Bonding Jumper

Grounding Clip

Grounding Lug

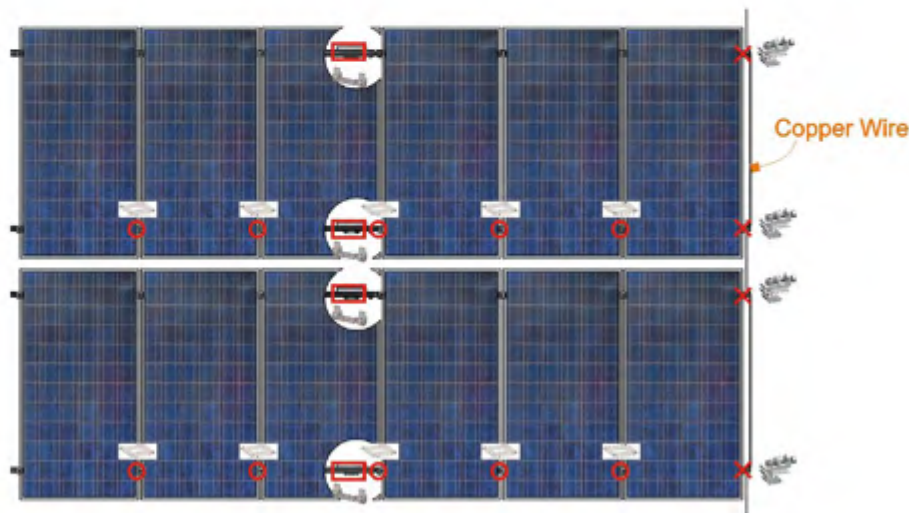
Braided Copper Wire  
Electrically connect spliced Rails

Ribs will penetrate module and rail anodization and create grounding path through rail

Ribs

## PLANNING LAYOUT

- Grounding Clip
- × Grounding Lug
- Bonding Jumper



## Grounding Clip

### Features

- Material: SUS304
- Special rib both surface to pierce the aluminum anodization
- Cooperated with Inter Clamp to install on the GS Rail

Item No.	Description
GR-G-GC	Grounding Clip



## Grounding Lug

### Features

- Connect system to equipment ground conductor
- High Pre-assembly

Item No.	Description
GR-G-GL	Grounding Lug

- Material: Al6005-T5 lay-in lug & Stainless Steel Clip & A2-70 bolt

Item No.	Description
GR-G-CGL	Copper Grounding Lug

- Material: Copper lay-in lug & Stainless Steel Clip & A2-70 bolt



## Bonding Jumper

### Features

- Material: Braided Copper Wire & Stainless Steel Clip & A2-70 bolt
- High Pre-assembly
- Electrically connect spliced Rails
- Excellent electric conductivity

Item No.	Description
GR-G-BJ	Bonding Jumper

