Datasheet

XR Rails

XR10 Rail

A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear & black anod. finish

XR100 Rail

The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear & black anod. finish

XR1000 Rail

A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Internal Splices

All rails use internal splices for seamless connections.

- Self-tapping screws
- Varying versions for rails
- Grounding Straps offered

Attachments

FlashFoot

Anchor, flash, and mount with all-in-one attachments.

- Ships with all hardware
- IBC & IRC compliant
- Certified with XR Rails

Slotted L-Feet

Drop-in design for rapid rail attachment.

- High-friction serrated face
- Heavy-duty profile shape
- Clear & black anod. finish

Standoffs

Raise flush or tilted systems to various heights.

- Works with vent flashing
- Ships pre-assembled
- 4" and 7" Lengths

Tilt Legs

Tilt assembly to desired angle, up to 45 degrees.

- Attaches directly to rail
- Ships with all hardware
- Fixed and adjustable

Clamps & Grounding

End Clamps

Slide in clamps and secure modules at ends of rails.

- Mill finish & black anod.
- Sizes from 1.22" to 2.3"
- Optional Under Clamps

Grounding Mid Clamps

Attach and ground modules in the middle of the rail.

- Parallel bonding T-bolt
- Reusable up to 10 times
- Mill & black stainless

T-Bolt Grounding Lugs

Ground system using the rail's top slot.

- Easy top-slot mounting
- Eliminates pre-drilling
- Swivels in any direction

Accessories

Provide a finished and organized look for rails.

- Snap-in Wire Clips
- Perfected End Caps
- UV-protected polymer

Free Resources

Design Assistant
Go from rough layout to fully engineered system. For free.
Go to IronRidge.com/rm

NABCEP Certified Training
Earn free continuing education credits, while learning more about our systems.
Go to IronRidge.com/training

S-5!® The Right Way!®

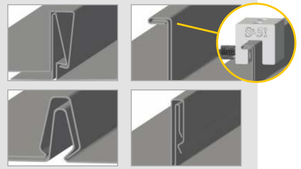
The strength of the S-5-S clamp is in its simple design. The patented setscrews will slightly dimple the metal seam material but not pierce it—leaving roof warranties intact.

The **S-5-S** and **S-5-S Mini** clamps are each furnished with the hardware shown to the right. Each box also includes a bit tip for tightening setscrews using an electric screw gun. A structural aluminum attachment clamp, the S-5-S is compatible with most common metal roofing materials excluding copper. All included hardware is stainless steel. Please visit **www.S-5.com** for more information including CAD details, metallurgical compatibilities and specifications.

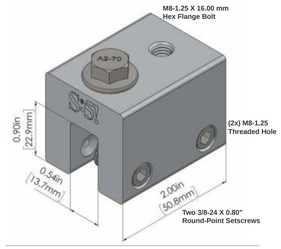
The S-5-S clamp has been tested for load-to-failure results on most major brands and profiles of standing seam roofing. The independent lab test data found at www.S-5.com can be used for load-critical designs and applications. S-5!® holding strength is unmatched in the industry. Profiles that are shaped as illustrated below will work with the S-5-S and S-5-S Mini. In order for the S-5-S or S-5-S Mini to fit these types of seams, the finished seam must:

- Be at least 1.00" high.
- Have a height distance less than or equal to 0.25" between the male portion of the panel and female portion of the panel.

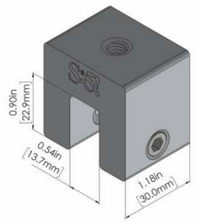
Example Profiles



S-5-S Clamp



S-5-S Mini Clamp

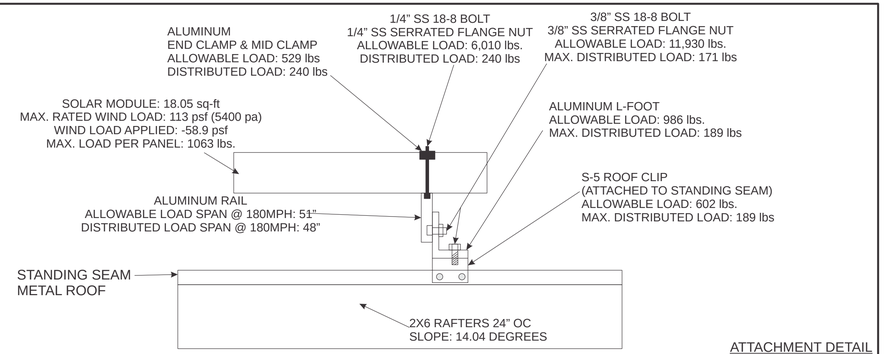


Please note: All measurements are rounded to the second decimal place.

S-5!® Warning! Please use this product responsibly!

Products are protected by multiple U.S. and foreign patents. Visit the website at www.S-5.com for complete information on patents and trademarks. For maximum holding strength, setscrews should be tensioned and re-tensioned as the seam material compresses. Clamp setscrew tension should be verified using a calibrated torque wrench between 160 and 180 inch pounds when used on 22ga steel, and between 130 and 150 inch pounds for all other metals and thinner gauges of steel. Consult the S-5! website at www.S-5.com for published data regarding holding strength.

Distributed by



ATTACHMENT DETAIL

ASCE 7-10 Velocity Pressure

$qz10 = 0.00256 Kz\ Kzt\ Kd\ V2$

where:
qz10 = *ASCE 7-10* velocity pressure evaluated at mean roof height (psf)
Kz = velocity pressure exposure coefficient
Kzt = topographic factor
Kd = wind directionality factor
V = basic wind speed (mph) from *ASCE 7-10* maps referred to as ultimate wind speed maps in *2012 IBC*.

As an example, for an array having an area of 158.04 sq.-ft., the total uplifting (resultant) force acting on the array would be -39.1 psf x 158.04 sq. ft. = -6,179.364 lb. Knowing this resultant force, the design engineer can now determine the number of attachment points and the size of the mounting hardware necessary to safely carry this load.

Live Loads:

Live loads associated with photovoltaic systems are usually assumed to be distributed uniformly and are small, on the order of 4 psf or less.

MANUFACTURER CONTACT INFO.

S-5! Attachment Solutions
Metal Roof Innovations, LTD.
8655 Table Butte Road
Colorado Springs, CO 80908
(888) 825-3432
(719) 495-0045 (fax)

General Information
info@s-5.com

REVISIONS:

Project: SONNIA & FERNANDO MONDRAGON
1526 71st St,
Miami Beach, FL 33141
STRUCTURAL DIAGRAM & CALCULATION

2001 W Sample Road. Suite 320
Deerfield Beach, Florida 33064
(818) 929-7125
Lic: #CVC057052 & #CGC058270

S-5 LOAD TABLE

Load Test Results (Negative Load Normal to Seam)

This page shows our current list of Load Test Results. You can filter test results by Panel Manufacturer and/or Product. Choose from the options below to display the desired load test results.

Panel Manufacturer: Englert
Product: Series 2000
Units: Imperial
Safety Factor: 2
SHOW RESULTS

Showing Test Results for Series 2000 by Englert

S-5! CLAMP	MANUFACTURER	PRODUCT	THICKNESS MATERIAL	SCREW TENSION (inch-lbs)	ULTIMATE LOAD (lbs)	FAILURE MODE	ALLOWABLE LOAD (lbs)	NOTES
S-5-S Mini	Englert	Series 2000	24 ga steel	115	1203	D	602	
S-5-S Mini	Englert	Series 2000	.032 alum	115	1051	D	526	
S-5-U Mini	Englert	Series 2000	24 ga steel	115	1457	C/D	729	
S-5-U Mini	Englert	Series 2000	22 ga steel	150	2038	C/D	1019	
S-5-U Mini	Englert	Series 2000	.032 alum	115	967	C/D	484	

TRIBUTARY AREAS WIND LOAD CALCULATIONS

WIND PRESSURE ZONES	ZONE 1 INTERIOR	ZONE 2 EDGE	ZONE 3 CORNER
MAX Area per ZONE (ft^2)	2.9	2.9	0
MAX UPLIFT per ZONE (lbs.)	115	189	0

S-5 Clamp Pull Out Calculations

Ultimate loads	1203 lbs.	
Allowable loads	1203 lbs. / 2 = 602lbs.	
Allowable Pull Out Strength per Clamp		602 lb
Max. Pull Out Strength Required per Clamp		189
Allowable Clamp Pull Out Strength Safety Factor		3.19
Ultimate Clamp Pull Out Strength Safety Factor		6.37

DESIGN WIND PRESSURE CALCULATIONS
FOR SOLAR MODULES INSTALLED ON ROOFS

RYAN GOOLABSINGH
FL P.E. 82345

Digitally signed by Ryan Goolabsingh
Date: 2020.12.02 23:20:23-05'00'

ABOUT THIS TOOL:
This tool is based on the C&C Wind Loads for Enclosed buildings. Design wind pressures are calculated using ASCE 7-10 equation 30.6-1 All notes in Figures 30.4-1 and 30.4-2(A,B and C) have been incorporated. Mean roof height must be less than 60 feet

SITE INFORMATION

		RISK CATEGORY	II	
MEAN ROOF HEIGHT (ft)	14	ESPOSURE CATEGORY	C	
LENGTH (ft)	53	ROOF SLOPE (°)	14.04	
WIDTH (ft)	63	ROOF TYPE	GABLE	
PARAPET HEIGHT (ft)	0	ULTIMATE WIND SPEED	175 mph	
MODULE LENGTH (in)	65	NOMINAL WIND SPEED	136 mph	
MODULE WIDTH (in)	39.10	K_D	0.85	
# OF MODULES IN ROW	1	K_{ZT}	1.0	
EFFECTIVE WIND AREA (ft^2)	18.0	K_z	0.85	

DESIGN CALCULATIONS

VELOCITY PRESSURE (q) = $.00256*K_zK_{zT}K_DV^2$
VELOCITY PRESSURE(ASD) 33.9

WIDTH OF PRESSURE COEFFICIENT
53' * 10% = 5.3'
14' * 40% = 5.6'
WIDTH 5' 4"

EXTERNAL PRESSURE COEFFICIENT

ZONE 1	0.9	-0.9
ZONE 2	0.9	-1.6
ZONE 3	0.9	-2.4

INTERNAL PRESSURE COEFFICIENT (+/-) 0.18

DESIGN PRESSURES

ROOF ZONE	DOWN	UP	
1	35.8	-35.8	psf
2	35.8	-58.9	psf
3	35.8	-88.6	psf

RDG ENGINEERING, INC.
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MIAMI, FL 786.423.2335

I CERTIFY THAT THIS PV SYSTEM FULLY COMPLIES WITH THE REQUIREMENTS OF NEC 690.

SEAL: RYAN D. GOOLABSINGH LICENSE No. 82345 12/02/2020 STATE OF FLORIDA PROFESSIONAL ENGINEER

DATE: 10/30/2020
SCALE: NTS
DRAWN BY: J.B

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