

Please note in general before installation with S-5!® Clamps



- Please make sure that the load coming into the clamp will be taken by the structure of the roof. Assumption is that the determination has been made that the roof to which the S-5! clamps will be attached is structurally adequate. Any loads imposed on the S-5! clamps will be transferred to the panels. Panel seams must have sufficient flexural strength to carry these loads. Panels must also be adequately attached to the building structure, and the structure must be sufficient to carry these loads. In particular, the snow and wind loads, the additional loads from the installations attached to the clamps, as well as the increased loads in the edge and corner areas of the roof construction must be considered. A sufficient number of clamps must be provided. For statically relevant clamps, a distance of at least 500mm from the end of the standing seam profile must be maintained. RoofTech and the makers of the S-5! clamps make no representations with respect to these variables. It is the responsibility of the user to verify this information, or seek assistance from a qualified design professional or stress analyst, if necessary.
- Responsible for the stability of a building structure is the building owner or the owner or operator. The installer of the system is responsible not only for the system but also for the roof on which the system is installed. Whoever installs a system on an existing roof without having checked the stability beforehand, violates existing law! For critical installations, inquire for specific test data of ultimate tensile load on specific panel materials and seam types. The sufficient holding force of the roofing to the supporting or substructure must always be ensured. The sufficient holding force of the roofing on the supporting or substructure must always be guaranteed. Proof must be provided by the customer or installer. In cases of doubt, a structural engineer must be consulted to determine the loads and its effects.
- **Please note the installation instructions of the respective S-5!® clamps and the other products used!** Mounting the clamps take care that the set screws and bolts are tightened with the right screw tension as written in each installation instruction (available on the homepage of RoofTech: www.rooftech.de and S-5!: www.s-5.com). When tabled values are used, screw tensions should be verified and factors of safety should be used as appropriate. If you are missing important and necessary information, please request it from us.
- When mounting rigid objects such as rails, pipes, cable trays, etc. on the clamps, they must be separated at regular intervals (max. 3m) in order to limit deformations due to thermally induced length changes of the mounted materials.
- The thermally induced change in length of the roofing must not be hindered! With some roofs made of profiled sheets (e.g. with round bulb seams, snap folded seams, RibRoof seams, etc.), it must be ensured that the clamps in the sliding area of the sheets are not mounted on or next to the holders of the roofing. In the case of double standing seam roofing, the S-5!® E and B clamps can, under certain circumstances, hinder the thermally induced length change of the sheet if, despite the high clamping point of the S-5!® E and B clamps, the foot of a sliding clip extends into the clamping area of the clamp. In this case, the S-5!® E and B clamps should be placed at a distance of 25 mm from the sliding clips.
- In the case of handcrafted metal roofing on wooden formwork, the edge and corner areas should not be covered with PV-modules due to the limited load-bearing capacity of the roofing and the adhesives. In the central area, the skipping of seams is usually not possible. Therefore, we recommend to install clamps on each seam. The installation of PV systems represents a punctual load entry; therefore, we recommend reduced clip distances and screwed clips. The mounting and fastening of the clamp should be carried out between the clips to achieve an optimal load sharing.
- Please observe the country-specific legal and official regulations for snow retention. Depending on the location of the building, height of the terrain above sea level, roof shape, roof pitch, type of metal roof and the respective holding strength of the S-5! clamps, the suitable snow guard systems must be professionally calculated and designed.
- The material properties of the respective metals, the combination with each other as well as the installation instructions and regulations of all manufacturers involved (including those of the metal roof) must be observed.
- The installation of our products should only be carried out by qualified and professional specialists with experience in installing on roofs. The suitability of our sold products for the intended use is checked by the user himself. If technical details are not described separately, this does not release the company carrying out the work from its obligation to check the individual case and clarify the correct technical facts beforehand.
- It must be ensured by the planner and the specialist company responsible for the installation that the planning and installation are carried out strictly in accordance with the national and site-specific building regulations, occupational safety and accident prevention regulations, standards and environmental protection regulations. Every person who plans and installs with our products is obliged to inform himself independently about all rules and regulations for technically correct planning and installation and to observe them. This also includes obtaining the current status of the necessary rules and regulations.
- S-5!® Warning: The S-5! clamp is a handy gadget for a great many uses, but will not perform miracles. Please use the products responsibly! Visit the website of S-5! (www.s-5.com) or RoofTech GmbH (www.rooftech.de) for available load test results. The user and/or installer of these parts is responsible for all necessary engineering and design to ensure the S-5! clamps have been properly spaced and configured.
- Notice to S-5! users: Due to the many variables involved with specific panel products, climates, snow melt phenomena, and job particulars, the manufacturer cannot and does not express any opinions as to the suitability of any S-5! assembly for any specific application and assumes no liability with respect thereto. S-5! products are tested for ultimate holding strength on various profile types and materials.
- The user and/or installer bears also the responsibility not only for the professional installation, but also for the roof on which he is mounted. The user and/or installer must always clarify in advance the application possibilities and application of our products in connection with the other used materials and products at the single project.
- The user and/or installer of all our products is responsible for all necessary engineering and design to ensure that the S-5! clamps and other products has been properly spaced and configured. It is the responsibility of the user to verify this information, or seek assistance from a qualified design professional or stress analyst, if necessary. RoofTech, the makers and distributor of S-5! clamps make no representations with respect to these variables.
- For critical installations, inquire for specific test data of ultimate tensile load on specific panel materials and seam types. When tabled values are used, screw tensions should be verified and factors of safety should be used as appropriate. RoofTech and the manufacturer expresses no opinions as to the suitability of the S-5! products for any specific application or project condition.
- S-5! Clamps are not suitable as fall protection applications. The S-5! clamps may only be used for this purpose in a certified and approved fall protection system. The respective system provider is responsible for this and must provide proof of this.
- The respective installation instructions must always be observed. However, the respective installation instructions do not release the executing company from the obligation to clarify in advance the possible uses and applications of our products, also in connection with the other materials used, on the individual object. RoofTech GmbH, S-5!® - Metal Roof Innovations Ltd. and the manufacturers of our other products assume no responsibility and liability for assembly, suitability and applications.
- Further information, load test results of the S-5! Clamps and the individual installation instructions for our products can be downloaded on our homepage: www.rooftech.de or on the homepage of S-5!: www.s-5.com. We would also be pleased to send you the requested information.

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S-5!® suggestions for spacing of S-5! mini clamps for PV arrays.

The following suggestions assume that determination has been made that the roof to which the S-5!® mini clamps will be attached is structurally adequate. Any loads imposed on the S-5! mini clamps will be transferred to the panels. Panel seams must have sufficient flexural strength to carry these loads. Panels must also be adequately attached to the building structure, and the structure must be sufficient to carry these loads. The makers of S-5! mini clamps make no representations with respect to these variables. It is the responsibility of the user to verify this information, or seek assistance from a qualified design professional if necessary.

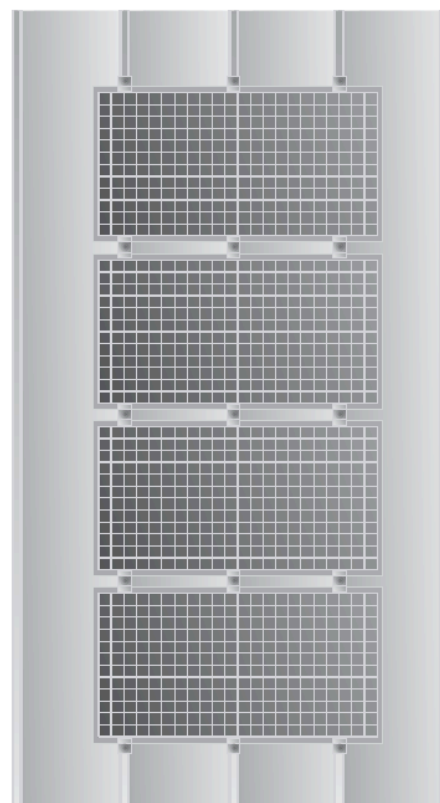
The key to frequency and spacing of attachment points for PV frames utilizing the S-5-PV Kit is to distribute loads to the metal standing seam panels in a manner that is consistent with the intended distribution of loads from the roof panels into the building structure. With very few exceptions, the attachment of a single S-5! mini clamp to the seam will be stronger than a single point of attachment of the seam to the building structure. Hence the "weak link" is not the S-5! mini clamp but the attachment clips that hold the metal panels to the building structure, or the beam strength of the roof panel seam itself.

The most conservative approach to the spacing/frequency of PV frame attachment to the roof is to determine the spacing/frequency of the roof's attachment to the building structure, then duplicate it at minimum. Determining panel attachment spacing in one axis is very simple. Standing seam panels' attachment will be made using concealed hold-down clips within the seam area of the panel. So, in that axis, the clip spacing is the same as the seam spacing. The location of the clips along the seam (in the other axis) can be determined by a) consultation with the roof system manufacturer or installer, b) checking from the underside or, c) close examination from the topside along the seam.

There will usually be a slight, but detectable, deformation of the seam at the clip location visible from the roof's topside. Many standing seam roof systems are installed on "pre-engineered" steel buildings. The attachment spacing in that industry is typically 5'-0" and is readily apparent by inspecting the spacing of the structural purlins to which the panel clips are attached from the roof underside (interior of the building).

If, for instance, the panel clips are spaced 5'-0" on center along the seam, then use the 5'-0" dimension as a maximum spacing for the S-5! mini clamps. (S-5! mini clamps may also be spaced at closer centers, but not wider.) When modules are attached directly without racking in the landscape orientation, this spacing dimension is dictated by the smallest dimension of the PV frame. Using the roof panel clip spacing as a maximum spacing template for S-5! mini clamps is a sound practice, whether the PV modules are attached directly to S-5! mini clamps, or to a racking system and then to the S-5! mini clamp (and panel seams). To evenly distribute loads, it is also necessary that each seam be involved in the finished assembly. Thus, every time a seam is traversed, it should be attached. Such an attachment scheme should evenly distribute wind loads into the building structure through the panels and their attachment, as was intended in the original roof construction assembly.

Please note these are only suggestions. Wind dynamics are complex, and S-5! advises review of the planned PV frame attachment design by a qualified professional who understands wind effects and metal roof design and construction. In certain solar installations, a design professional may determine that seams can be skipped as points of attachment, but this determination must be made on a job-specific basis.



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. Copyright 2014, Metal Roof Innovations, Ltd. S-5! products are patent protected. S-5! aggressively protects its patents, trademarks, and copyrights.

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Please use the products responsibly! Visit the website of S-5! (www.s-5.com) or contact RoofTech GmbH for more information. The user and/or installer of these parts is responsible for all necessary engineering and design to ensure the S-5! clamps have been properly spaced and configured. RoofTech GmbH and S-5!® – Metal Roof Innovations Ltd. assume no responsibility and liability for assembly, suitability and applications. No liability for printing errors. Subject to technical changes. © Copyright RoofTech GmbH and Metal Roof Innovations Ltd. 02-2020.