

Load Test Results of S-5! Clamps



To provide customers with high quality clamps combined with safety, S-5! tested the clamps intensively on a huge number of panels from many different metal producers. S-5! engineers the highest quality and most reliable metal roof attachment products on the market. One reason for the S-5! industry leadership is the extensive and rigorous testing to ensure safety and maintain the structural integrity of the roof. S-5! use a third-party A2LA accredited lab—the highest-regarded in the industry—and follow strict ASTM standards. This type of test tests the clamp itself and the connection of the clamp to the profile under test conditions.

For the European market the group of the E-Clamps for double folded standing seams and the group of Z-Clamps for the round-bulb seam profiles had been tested and approved by the DIBt (German Center of Competence for Civil Engineering – Authority of the German Government). DIBt No. Z-14.4-719



Tested and Approved

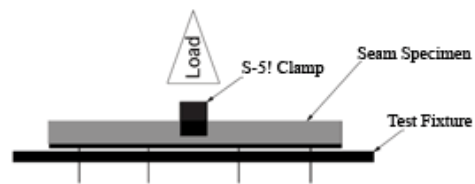
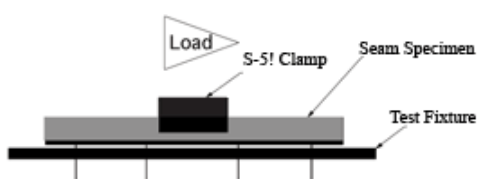
S-5!® has developed innovative clamps and brackets for various international metal roof profiles.



Using the S-5! Clamps and the load table please notice:

Mounting the clamps take care that the set screws are tightened with the right screw tension of 15-17 Nm on materials which are not steel. Please make sure that the load coming into the clamp will be taken by the structure of the roof. When planning the project the calculated loads should not only include wind, snow and planned use. The makers and supplier of 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. Please note the installation instructions under: www.rooftech.de or www.s-5.com.

Tests made with load pulling parallel (shear) to seam and with load pulling normal (tensile) to seam:



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Selection of Load Test Results of S-5! Clamps



In contrast to plagiarism and conventional seam clamps, only the original S-5!® Clamps are all multiple tested on different materials and profiles. The result of all tests was that the load capacities of the clamps are higher than those of the profiles. The following table shows a selection of test results of S-5! clamps on different in Europe common materials and profiles. These tests had been carried out by independent testing laboratories. [The complete list of test results, the S-5! terms of use and more information about installation you will find on the website of S-5!: www.s-5.com.](#)

Tested S-5! Clamp	Metal Producer	Product Name	Material	Thickness	Screw Tension (Nm)	Test Result Load	Test Method Z = Tensile S = Shear	Allowable Load *
S-5-B	KME	TECU	Copper	0,7 mm	13,0 Nm	5,67 kN	S	2,84 kN
S-5-B-Mini	KME	TECU	Copper	0,7 mm	13,0 Nm	6,30 kN	S	3,15 kN
S-5-E	Corus	Falzinc	Aluminium	0,7 mm	13,0 Nm	5,14 kN	S	2,57 kN
S-5-E	Corus	Titansilber	Aluminium	0,7 mm	13,0 Nm	4,22 kN	S	2,11 kN
S-5-E	Novelis	Falzonal	Aluminium	0,7 mm	13,0 Nm	5,34 kN	S	2,67 kN
S-5-E	Prefa	Prefalz	Aluminium	0,7 mm	13,0 Nm	4,65 kN	S	2,33 kN
S-5-E	Rheinzink	RHEINZINK	Titanium Zinc	0,7 mm	13,0 Nm	5,54 kN	S	2,77 kN
S-5-E	Rheinzink	RHEINZINK	Titanium Zinc	0,8 mm	13,0 Nm	7,44 kN	S	3,72 kN
S-5-E	Umicore	VM ZINC	Titanium Zinc	0,7 mm	13,0 Nm	6,58 kN	S	3,29 kN
S-5-E	Umicore	VM ZINC	Titanium Zinc	0,8 mm	13,0 Nm	7,25 kN	S	3,63 kN
S-5-E	Uginox	Uginox FTE	Stainless St.	0,5 mm	13,0 Nm	5,84 kN	S	2,92 kN
S-5-E-Mini	Novelis	Falzonal	Aluminium	0,7 mm	13,0 Nm	3,82 kN	S	1,91 kN
S-5-E-Mini	Novelis	Falzonal	Aluminium	0,7 mm	13,0 Nm	3,89 kN	Z	1,30 kN
S-5-E-Mini	Prefa	Prefalz	Aluminium	0,7 mm	13,0 Nm	3,46 kN	S	1,73 kN
S-5-E-Mini	Prefa	Prefalz	Aluminium	0,7 mm	13,0 Nm	3,82 kN	Z	1,27 kN
S-5-E-Mini	Privé	Sylinov No.1	Steel	0,6 mm	13,0 Nm	5,32 kN	S	2,66 kN
S-5-E-Mini	Privé	Sylinov No.1	Steel	0,6 mm	13,0 Nm	7,12 kN	Z	2,37 kN
S-5-E-Mini	Rheinzink	RHEINZINK	Titanium Zinc	0,7 mm	13,0 Nm	4,53 kN	S	2,26 kN
S-5-E-Mini	Rheinzink	RHEINZINK	Titanium Zinc	0,7 mm	13,0 Nm	5,38 kN	Z	1,79 kN
S-5-E-Mini	Rheinzink	RHEINZINK	Titanium Zinc	0,8 mm	13,0 Nm	4,86 kN	S	2,43 kN
S-5-E-Mini	Umicore	VM ZINC	Titanium Zinc	0,7 mm	13,0 Nm	5,24 kN	S	2,62 kN
S-5-E-Mini	Umicore	VM ZINC	Titanium Zinc	0,7 mm	13,0 Nm	4,90 kN	Z	1,63 kN
S-5-E-Mini	Uginox	Uginox FTE	Stainless St.	0,5 mm	13,0 Nm	7,40 kN	Z	2,46 kN
S-5-E-Mini	Uginox	Uginox FTE	Stainless St.	0,5 mm	13,0 Nm	4,68 kN	S	2,34 kN
S-5-E-Mini	Zintek	zintek	Titanium Zinc	0,8 mm	13,0 Nm	6,19 kN	Z	1,80 kN
S-5-E-Mini	Zintek	zintek	Titanium Zinc	0,8 mm	13,0 Nm	5,50 kN	S	2,75 kN
S-5-K-Grip-Mini + GXM10	Domico	Domitec	Aluminium	1,0 mm	22,6 Nm	2,32 kN	Z	0,77 kN
S-5-K-Grip-Mini + GXM10	Safintra	Saflock 410 (Intermediate Rib)	Steel	0.58 mm	22,6 Nm	3,36 kN	Z	1,12 kN
S-5-K-Grip-Mini + GXM50	Lysaght	Klip-lok Classic 700 (Intermediate Rib)	Steel	0,46 mm	22,6 Nm	2,83 kN	Z	0,94 kN
S-5-S	New Tech Machinery	SS 550 Snap Lock 1 1/2	Steel	0,6 mm	13,0 Nm	8,18 kN	S	4,09 kN
S-5-S	Imteco	SnapLok 38	Aluminium	0,8 mm	13,0 Nm	5,40 kN	S	2,70 kN
S-5-S-Mini	Privé	Sylinov No.3	Steel	0,6 mm	13,0 Nm	3,49 kN	S	1,75 kN
S-5-S-Mini	Privé	Sylinov No.3	Steel	0,6 mm	13,0 Nm	3,50 kN	Z	1,17 kN
S-5-Z	Bemo	Bemo Roof	Aluminium	0,8 mm	13,0 Nm	11,8 kN	S	5,88 kN
S-5-Z	Bemo	Bemo Roof	Aluminium	1,0 mm	13,0 Nm	10,9 kN	S	5,47 kN
S-5-Z	Bemo	Bemo Roof	Steel	0,6 mm	13,0 Nm	7,86 kN	S	3,93 kN
S-5-Z	Corus	Kal Zip	Aluminium	0,8 mm	13,0 Nm	11,8 kN	S	5,88 kN
S-5-Z	Corus	Kal Zip	Aluminium	1,0 mm	13,0 Nm	10,9 kN	S	5,47 kN
S-5-Z	Corus	Kal Zip	Steel	0,6 mm	13,0 Nm	7,86 kN	S	3,93 kN
S-5-Z-Mini	Aluform	Alufalz	Aluminium	1,0 mm	13,0 Nm	6,30 kN	Z	2,10 kN
S-5-Z-Mini	Aluform	Interfalz	Aluminium	1,0 mm	13,0 Nm	6,59 kN	Z	2,20 kN
S-5-Z-Mini	Bemo	Bemo Roof	Aluminium	1,0 mm	13,0 Nm	8,22 kN	S	4,11 kN
S-5-Z-Mini	Corus	Kal Zip	Aluminium	0,9 mm	13,0 Nm	7,64 kN	S	3,82 kN
S-5-Z-Mini	Corus	Kal Zip	Aluminium	0,9 mm	13,0 Nm	4,52 kN	Z	1,51 kN

* **Allowable loads** are listed utilizing a default Factor of Safety (FS) 2,0 for shear load and 3,0 for tensile load. This should be checked project related. Any loads imposed on the S-5! clamp will be transferred to the panels. Panel attachment and building structure must also be sufficient to carry these loads. It is the responsibility of the user to verify this information, or seek assistance from a qualified design professional or stress analyst, if necessary.

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RoofTech – Product Information:

S-5![®] Z- and E- Clamps have the national technical approval

All components in Germany related to fixing solar products for PV installations needs to carry a German approval by the DIBt (German Center of Competence for Civil Engineering - Authority of the German Government). Since March 2017 the S-5-Z- and S-5-E- Clamps have the national technical approval by the **DIBt, No: Z-14.4-719**.

The **S-5![®] Z-clamp family** have the national technical approval for the round „bulb“ seams for all these internationally operating producer:

- Kalzip-Aluminium-Stehfalzprofil from **Kalzip**
- BEMO-FLAT-ROOF from **Bemo**
- ALUFALZ and FALZ-RIPP from **Aluform**

The S-5-Z-Clamp, S-5-Z-Mini and S-5-Z-Mini-FL are currently the only clamps on the market with an approval for all these relevant round bulb seam profiles.

Please note this information from Kalzip:

Kalzip requires “an official approval for assembly with Kalzip” when using clamps from other manufacturers. For the installation of solar systems on Kalzip roofs, only tested system accessories approved for this purpose may be used. **Non-approved components invalidate the Kalzip warranty!**

Due to the approval by the DIBt, such proof is given for the S-5![®] Z clamp family and they may therefore can used for installations on such Kalzip roofs.

The **S-5![®] E-Clamp family** was tested on the **Rheinzink double folded seam system** and currently the only clamps on the market with an official approval for this double-folded standing seam roof.

Please note this information from Rheinzink:

Rheinzink basically only recommends the use of the S-5! Clamps, as only these have the official approval in connection with their roofs and thus offer the only possibility that a structural engineer can provide a static proof for the entire system.

Should the tradesman or planner nevertheless work with other clamps and this causes damage to the roof, then of course the Rheinzink material warranty and system warranty no longer apply.

In contrast to plagiarism and conventional seam clamps, only the original S-5![®] Clamps are all multiple tested on different materials and profiles. Combined with the versatile possibilities of fixing on the S-5![®] clamps they are the best choice to attach almost everything without penetration to the roof. The S-5![®] Clamps offer reliability, permanence and holding strength unmatched by any other attachment system.

Please don't hesitate to contact us for further information and the test results.

The S-5-E- und S-5-Z-Clamps families have been tested according the test program for the general approval by the DIBt in all four load directions. The extensive test procedure was made by the well-known institute KIT (Karlsruhe Institute of Technology).



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Load capacity values for the S-5-E-Clamps from the building approval (Z-14.4-719)

The S-5-E-Clamps were tested on the Rheinzink double standing seam system and since March 2017 the S-5-E Clamps have the national technical approval by the DIBt (German Center of Competence for Civil Engineering - Authority of the German Government), No: Z-14.4-719.

The DIBt approval applies to all three different versions of the S-5!® E-Clamps:



The testing was conducted by the well-known University KIT (Karlsruhe Institute of Technology). The testing was conducted to determine load values. It was an assembly test wherein the clamp was spaced 200 and 500 mm away from the concealed roof clip. Based on these investigations it is now possible in the planning phase, to make the entire system work harmoniously with respect to clamp population.

The following load capacity values were determined on the Rheinzink double folded standing seam system with the CLIPFIX clips for all three S-5-E-Clamps:

Material: titanium zinc, material thickness: 0.7 mm,

Clip distance: 200 to 500 mm

Characteristic tensile strength (negative load normal to roof seam):

with clip distance 200 mm: 1.89 kN

with clip distance 500 mm: 0.78 kN

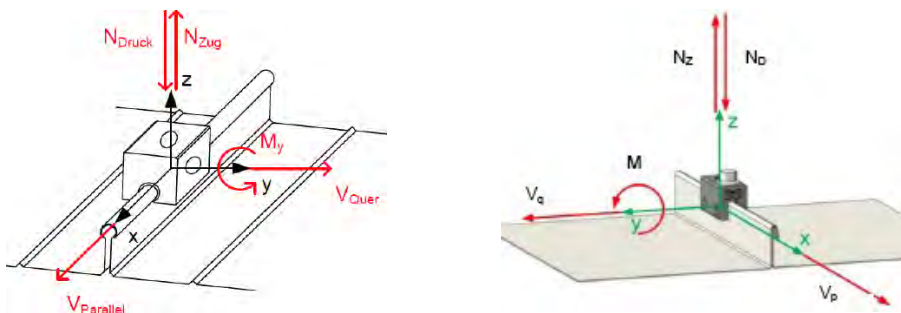
Intermediate values can be interpolated.

Characteristic shear capacity (parallel load to roof seam): 1.27 kN

Characteristic pressure resistance (positive load normal to roof seam): 1.55 kN

These values for the S-5-E-Clamps can be also be utilized for roof cladding with greater material thickness.

The S-5-E Clamps have been extensively tested in the four load directions required:



The result of all tests was that the load-bearing capacities of the S-5!® clamps are higher than those of the roof itself. The tests and the approval thus confirm the well-known high quality and load-bearing capacity of the S-5!® clamps as well as their suitability for mounting solar systems. The load-bearing capacity values from the building approval Z-14.4-719 may be used for static calculations.

The respective installation instructions, the results of the Z-Clamps and further information can be requested from us.



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The Clamp Assortment 2020



The Clamps from S-5!® come in a variety of options with M8 thread on top and a M8 Stainless Steel bolt or with flange. The normal S-5!® clamps with two bullet-nosed, stainless steel set screws for attachment to the seams are used for heavy demands e.g. fall protection systems and in the ColorGard® snow retention.

The S-5!® Mini-Clamps with one set-screw are utilized when multiple clamps are required for the attachment of stiff objects, to the seams. For further information, installation instructions and test results concerning the holding strength please contact us or see on our homepage: www.rooftech.de.

E-Clamps for Double Folded Seams

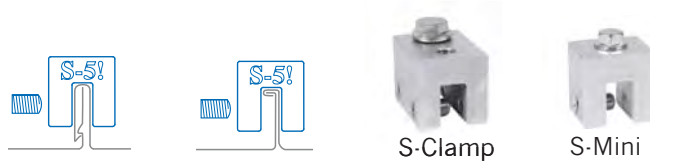
For double folded standing seam roofs made of aluminum, titanium-zinc, stainless steel or coated galvanized steel.

Official approved by the DIBt.: Z-14.4-719.



S-Clamps for Snap Lock and Angle Seams

With a bigger opening slot of 14mm the S-Clamps are extremely versatile for a big number of industrial seams such as Snap-Lock or Snap-together profiles from Fischer-Kliptec, Schleibach, Prive-Stylinov, Ruukki or similar.



Z-Clamps for Round Bulb Seams

Z-Clamps are specially developed to fit profiles having round "bulb" seams with a 23mm diameter such as roofs of Kalzip®, Bemo®, Aluform, Euroseam® or Kingspan.

Official approved by the DIBt.: Z-14.4-719.



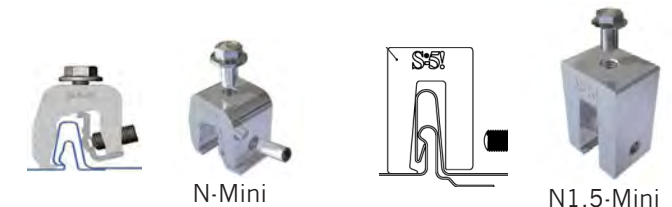
B-Clamps for Copper roofs

The B-Clamp and B-Mini are the right choice for copper double folded seam roofs. The "B" stand for Brass, the material of the clamps.



N-Mini and N1.5-Mini Clamps for Nail Strip Seams

The new N-Mini clamp was designed for applications on 1" (25mm) high and the N1.5-Mini clamp for 1.5" (38mm) high nail strip profiles and metal roof types with similar profiles.



Multi-Trapezoidal Bracket MTH with self-adhesive sealing strips and mounting bracket with slotted hole M10. Material: stainless steel. For mounting on many different trapezoidal sheet metal and sandwich profiles up to 43mm top chord width.

Official approved by the DIBt.: Z-14.4-706.



We keep the S-5!® products that are common on the European market in stock. All not stocked S-5!® products can be imported from S-5!® USA, after customer request – even in small quantities and in short time with air freight. Please call us for quote.

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