

Tested holding strength of the 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.

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*

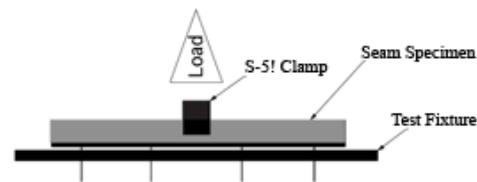
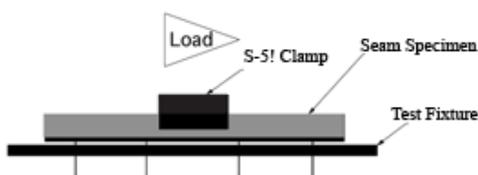
S-5!® has developed innovative clamps and brackets for various international metal roof profiles.



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 many different materials and profiles by a third-party accredited US-lab. All S-5!® E and Z-Clamps were also tested and approved by the German building authorities.

Below is a first selection of the holding strengths of the S-5!® clamps tested by US testing institutes on seam and material types commonly used in Europe. The values of the E-Mini are identical for the E-Mini-FL.

This type of test tests the clamp itself and the connection of the clamp to the seam/profile under test conditions.

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The contents of the tests may only be copied, used or passed on after agreement with RoofTech GmbH or Metal Roof Innovations Ltd.. 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.

S-5!® Clamp	Metal Roof Producer	Roof panel	Material	Material Thickness	Setscrew Tension	Test Result	Test Method Scheer = Parallel Zug = Normal	Allowable Load *
E-Clamp	Corus	Falzinc	Aluminium	0,7 mm	13,0 Nm	5,14 kN	Scher	2,57 kN
		Titansilber	Aluminium	0,7 mm	13,0 Nm	4,22 kN	Scher	2,11 kN
	Novelis	Falzonal	Aluminium	0,7 mm	13,0 Nm	5,34 kN	Scher	2,67 kN
	Haushaut	DF-Falz	Aluminium	0,7mm	13,0 Nm	4,91 kN	Scher	2,46 kN
	Prefa	Prefalz	Aluminium	0,7 mm	13,0 Nm	4,65 kN	Scher	2,33 kN
	Rheinzink	Rheinzink Doppelstehfalz	Titanzink	0,7 mm	13,0 Nm	5,54 kN	Scher	2,77 kN
		Rheinzink Doppelstehfalz	Titanzink	0,8 mm	13,0 Nm	7,44 kN	Scher	3,72 kN
	NedZink	NATUREL	Titanzink	0,7mm	13,0 Nm	6,05 kN	Scher	3,02 kN
	Umicore	VM ZINC	Titanzink	0,7 mm	13,0 Nm	6,58 kN	Scher	3,29 kN
		VM ZINC	Titanzink	0,8 mm	13,0 Nm	7,25 kN	Scher	3,63 kN
	Zintek	zintek Doppelstehfalz	Titanzink	0,7 mm	13,0 Nm	5,27 kN	Scher	2,67 kN
Roofinox	ASP ML-100	Edelstahl	0,5 mm	13,0 Nm	6,89 kN	Scher	3,44 kN	
Uginox	Uginox FTE	Edelstahl	0,5 mm	13,0 Nm	5,84 kN	Scher	2,92 kN	
E-Mini	Corus	Falzinc	Aluminium	0,7 mm	13,0 Nm	4,44 kN	Scher	2,22 kN
		Titansilber	Aluminium	0,7 mm	13,0 Nm	4,12 kN	Scher	2,06 kN
	Haushaut	DF-Falz	Aluminium	0,7 mm	13,0 Nm	3,75 kN	Zug	1,25 kN
	Novelis	Falzonal	Aluminium	0,7 mm	13,0 Nm	3,82 kN	Scher	1,91 kN
		Falzonal	Aluminium	0,7 mm	13,0 Nm	3,89 kN	Zug	1,30 kN
	Prefa	Prefalz	Aluminium	0,7 mm	13,0 Nm	3,46 kN	Scher	1,73 kN
		Prefalz	Aluminium	0,7 mm	13,0 Nm	3,82 kN	Zug	1,27 kN
	Rheinzink	Rheinzink Doppelstehfalz	Titanzink	0,7 mm	13,0 Nm	4,53 kN	Scher	2,26 kN
		Rheinzink Doppelstehfalz	Titanzink	0,7 mm	13,0 Nm	5,38 kN	Zug	1,79 kN
		Rheinzink Doppelstehfalz	Titanzink	0,8 mm	13,0 Nm	4,86 kN	Scher	2,43 kN
	NedZink	NATUREL	Titanzink	0,7mm	13,0 Nm	5,44 kN	Zug	1,81 kN
	Umicore	VM ZINC	Titanzink	0,7 mm	13,0 Nm	5,24 kN	Scher	2,62 kN
		VM ZINC	Titanzink	0,7 mm	13,0 Nm	4,90 kN	Zug	1,63 kN
Zintek	zintek Doppelstehfalz	Titanzink	0,8 mm	13,0 Nm	6,19 kN	Zug	2,06 kN	
Roofinox	ASP ML-100	Edelstahl	0,5 mm	13,0 Nm	8,30 kN	Zug	2,77 kN	
Uginox	Uginox FTE	Edelstahl	0,5 mm	13,0 Nm	7,40 kN	Zug	2,46 kN	
S-Clamp	Fischer	Kliptec Snapfalz	Stahl	0,82 mm	17,0 Nm	8,76 kN	Scher	4,38 kN
	Jacobi	Jacobi-Snapfalz 38	Stahl	0,75 mm	17,0 Nm	7,90 kN	Scher	3,95 kN
	Privé	Sylinov No.3 Snapfalz	Stahl	0,6 mm	17,0 Nm	4,21 kN	Zug	2,10 kN
	NeZink	Winkelstehfalz 24mm	Titanzink	0,7 mm	13,0 Nm	5,29 kN	Scher	2,65 kN
	Haushaut	Winkelstehfalz 25mm	Aluminium	0,7 mm	13,0 Nm	4,89 kN	Scher	2,45 kN
	Protectum	RS50-PS Winkelstehfalz	Edelstahl	0,5 mm	13,0 Nm	6,08 kN	Scher	3,04 kN
S-Mini	Fischer	Kliptec Snapfalz	Stahl	0,82 mm	17,0 Nm	5,51 kN	Zug	1,80 kN
	Jacobi	Jacobifalz 38 Snapfalz	Stahl	0,75 mm	17,0 Nm	6,74 kN	Zug	2,25 kN
	Privé	Sylinov No.3 Snapfalz	Stahl	0,6 mm	17,0 Nm	3,50 kN	Zug	1,17 kN
	NedZink	Winkelstehfalz 24mm	Titanzink	0,7 mm	13,0 Nm	3,16 kN	Zug	1,05 kN
	Haushaut	Winkelstehfalz 25mm	Aluminium	0,7 mm	13,0 Nm	2,35 kN	Zug	0,78 kN
	Protectum	RS50-PS Winkelstehfalz	Edelstahl	0,5 mm	13,0 Nm	5,06 kN	Zug	1,69 kN

* Allowable loads are listed utilizing a default Factor of Safety: 2,0 for shear/parallel load and 3,0 for tensile/normal load.

Selection of Load Test Results of S-5!® Clamps



Below is a second selection of the holding strengths of the S-5!® clamps tested by US testing institutes on seam and material types commonly used in Europe. The values of the Z-Mini are identical for the Z-Mini-FL. This type of test tests the clamp itself and the connection of the clamp to the seam/profile under test conditions.

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S-5!® Clamp	Metal Roof Producer	Roof panel	Material	Material Thickness	Setscrew Tension	Test Result	Test Method Scher = Parallel Zug = Normal	Allowable Load *
Z-Clamp	Aluform	Alufalz 65	Aluminium	0,8 mm	13,0 Nm	7,98 kN	Scher	3,99 kN
		Alufalz 65	Aluminium	1,0 mm	13,0 Nm	10,8 kN	Scher	5,42 kN
		Interfalz 65	Aluminium	0,8 mm	13,0 Nm	8,78 kN	Scher	4,39 kN
		Interfalz 65	Aluminium	1,0 mm	13,0 Nm	10,9 kN	Scher	5,46 kN
	Bemo	Bemo Roof	Aluminium	0,8 mm	13,0 Nm	11,8 kN	Scher	5,88 kN
		Bemo Roof	Aluminium	1,0 mm	13,0 Nm	10,9 kN	Scher	5,47 kN
		Bemo Roof	Stahl	0,6 mm	17,0 Nm	7,86 kN	Scher	3,93 kN
	Corus	Kal Zip	Aluminium	0,8 mm	13,0 Nm	11,8 kN	Scher	5,88 kN
		Kal Zip	Aluminium	1,0 mm	13,0 Nm	10,9 kN	Scher	5,47 kN
Kal Zip		Stahl	0,6 mm	17,0 Nm	7,86 kN	Scher	3,93 kN	
Z-Mini	Aluform	Alufalz 65	Aluminium	0,8 mm	13,0 Nm	5,82 kN	Scher	2,91 kN
		Alufalz 65	Aluminium	0,8 mm	13,0 Nm	3,56 kN	Zug	1,19 kN
		Interfalz 65	Aluminium	0,8 mm	13,0 Nm	4,13 kN	Zug	1,38 kN
		Interfalz 65	Aluminium	1,0 mm	13,0 Nm	6,59 kN	Zug	2,20 kN
	Bemo	Bemo Roof	Aluminium	1,0 mm	13,0 Nm	8,22 kN	Scher	4,11 kN
		Bemo Roof	Aluminium	1,0 mm	13,0 Nm	2,76 kN	Zug	0,92 kN
	Corus	Kalzip 65	Aluminium	0,9 mm	13,0 Nm	7,64 kN	Scher	3,82 kN
		Kalzip 65	Aluminium	0,9 mm	13,0 Nm	4,52 kN	Zug	1,51 kN
	Kingspan	KingZip	Stahl	0,5 mm	17,0 Nm	4,54 kN	Zug	1,51 kN
KingZip		Aluminium	0,9 mm	13,0 Nm	4,62 kN	Zug	1,54 kN	
B-Clamp	KME	TECU 25mm	Kupfer	0,7 mm	13,0 Nm	5,67 kN	Scher	2,84 kN
B-Mini	KME	TECU 25mm	Kupfer	0,7 mm	13,0 Nm	4,45 kN	Zug	1,48 kN
N-Mini	Lysaght	ENSEAM 25mm	Stahl	0,51 mm	13,0 Nm	5,30 kN	Zug	1,77 kN
	McElroy Metal	Meridian	Stahl	0,40 mm	13,0 Nm	3,21 kN	Zug	1,07 kN
N1.5-Clamp	SCH Holland	Nailstrip Klikfels 35-500	Stahl	0,56 mm	17,0 Nm	5,24 kN	Scher	2,62 kN
N1.5-Mini	SCH Holland	Nailstrip Klikfels 35-500	Stahl	0,56 mm	17,0 Nm	5,12 kN	Zug	1,71 kN
	New Tech Mach.	Nailstrip SS40SL	Stahl	0,51 mm	17,0 Nm	6,07 kN	Zug	2,02 kN
R465-Mini	Zambelli	Rib-Roof 465	Aluminium	0,7 mm	13,0 Nm	4,07 kN	Scher	2,04 kN
		Rib-Roof 465	Aluminium	0,7 mm	13,0 Nm	4,088 kN	Zug	1,63 kN
K-Grip-Mini + GMX10 Insert	Domico	Domitec	Aluminium	1,0mm	13,0 Nm	2,32kN	Zug	0,77 kN
	Safintra	Saflock 410	Stahl	0,58 mm	17,0 Nm	3,36 kN	Zug	1,12 kN

* Allowable loads are listed utilizing a default Factor of Safety: 2,0 for shear/parallel load and 3,0 for tensile/normal load.

The result of all test was that the weak points are usually not the S-5! Clamps but the roofing and its fastening. 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 and installer to verify this information, or seek assistance from a qualified design professional or stress analyst, if necessary.

RoofTech GmbH and S-5!® - Metal Roof Innovations Ltd. recommend in principle that the planned installation, PV system, snow guard system, etc. should be verified by a qualified professional who is responsible for the snow and wind loads, the additional loads from the installations attached to the clamps, the statics and assembly as well as the planning and construction of and on metal roofs. RoofTech GmbH and S-5!® - Metal Roof Innovations Ltd. assume no responsibility and liability for assembly, suitability and applications.

We would also be pleased to send you the respective installation instructions and the requested information. We look forward to your message or call.

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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).





Load capacity values for the S-5!® E-Clamps from the approval by the DIBt: Z-14.4-719

The S-5!® E-Clamps were tested on the Rheinzink double standing seam system and since 2017 all 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

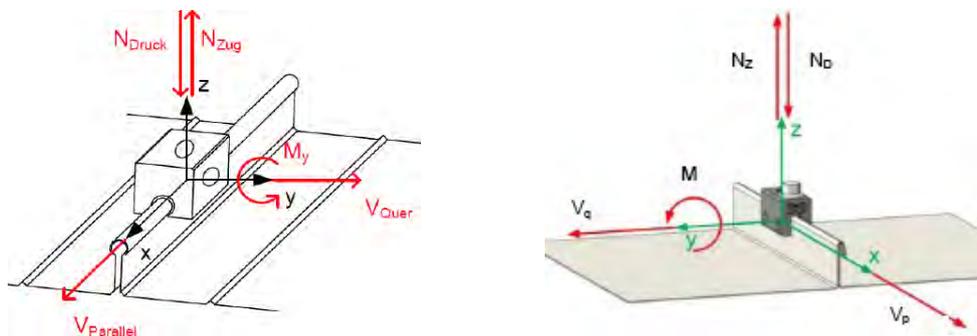
Intermediate values can be interpolated.

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.

Clamp Assortment 2021



The S-5!® Clamps 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 used at applications where rigid objects, such as rails, fixed to the seams with multiple clamps. **From 2021, the S-5!® Mini clamps will be supplied without M8 stainless steel screws. These can then be ordered separately. See: www.rooftech.de**

S-5!® E-Clamps for Double Folded Seams

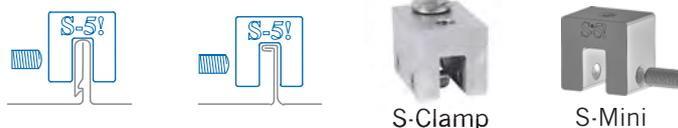
For double folded standing seam roofs made of aluminium, titanium-zinc, stainless steel or coated galvanized steel.

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



S-5!® S-Clamps for Snap Lock and Angle Seams

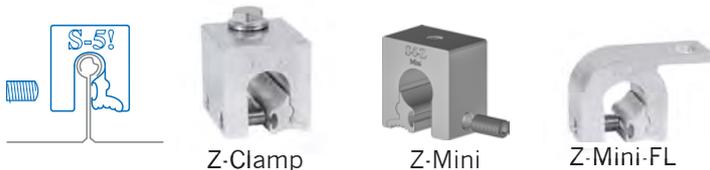
With a bigger opening slot of 14mm the S-Clamps are extremely versatile for a big number of industrial seams such as Snap-Lock or Snap-together profiles from Fischer-Kliptec, Schlebach, Prive-Stylinov, Ruukki or similar. As well for standard angle seams.



S-5!® Z-Clamps for Round Bulb Seams

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

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



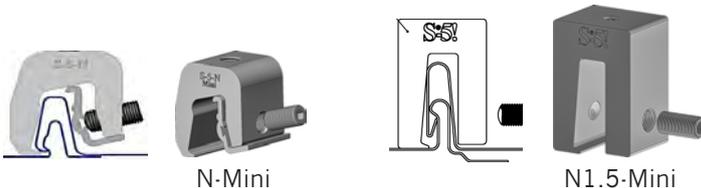
S-5!® B-Clamps for Copper Roofs

The B-clamps with an opening slot of 6mm are designed for Copper double-folded standing seam roofs. The B-Clamps, made of Brass, allows material compatible installations.



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

The 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 stock the above S-5!® Clamps that are common in the European market. 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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