# ICC-ES Evaluation Report

**ESR-3869**

*Reissued July 2023*

*Revised January 2025*

*Subject to renewal July 2025*

*This report also contains:*

- **CA Supplement**

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| DIVISION: 05 00 00—METALS<br><br>Section: 05 05 23—METAL FASTENINGS | REPORT HOLDER:<br><br>S-5! METAL ROOF INNOVATIONS, LTD. | EVALUATION SUBJECT:<br><br>S-5! STANDING SEAM CLAMPS | |
|---|---|---|---|

## 1.0 EVALUATION SCOPE

**Compliance with the following codes:**

- 2024, 2021, 2018 and 2015 *International Building Code*® (IBC)
- 2024, 2021, 2018 and 2015 *International Residential Code*® (IRC)

**Property evaluated:**

- Structural

## 2.0 USES

The S-5! Standing Seam Clamps are used to attach nonstructural components to standing seam metal roofs described in this report and are designed to transfer uplift and parallel loads. The clamps may be used on structures regulated under the IRC when addressed in an engineered design in accordance with IRC Section R301.1.3.

## 3.0 DESCRIPTION

### 3.1 General:

The S-5! clamps consist of an aluminum clamp with or without an aluminum insert, M8-1.25 stainless steel bolt(s), and No. 3/8-24 (10 mm) stainless steel set screws. The applicable S-5! clamp models are identified in Table 1. See Figure 1 for depictions of the S-5! clamps.

### 3.2 Material:

The clamps and inserts are made from extruded 6061-T6 aluminum. The stainless steel bolts are made from 300 series stainless steel having a minimum tensile strength of 101.5 ksi (700 MPa) and minimum yield strength of 65.3 ksi (450 MPa). The stainless steel set screws are made from 300 series stainless steel.

## 4.0 DESIGN AND INSTALLATION

### 4.1 Design:

The values shown in Table 1 of this report represent the connection capacity of the S-5! clamps to the described standing seam metal roof. The connection of the nonstructural components to the S-5! clamps must be designed by a registered design professional and must not exceed the published values in Table 1. The ability of the standing seam metal roof to resist the loads applied by the clamps must be determined by a registered design professional.

### 4.2 Installation:

The S-5! clamps are designed to fit the seam configuration of the standing seam metal roof. Installation is limited to the standing seam metal roofs described in Table 1 of this report. Once the clamp and insert have been placed on the seam, the set screws must be tightened to a torque as indicated in Table 1 of this report. Ancillary items are fixed to the clamps using the supplied bolts. The bolt-thread must engage the clamp a minimum of 0.32-inch (8.1 mm).

### 4.3 Special Inspection:

In Seismic Design Categories E and F, periodic special inspection as indicated in Item 2 of 2024 and 2021 IBC Section 1705.13.6 (2018 and 2015 IBC Section 1705.12.6) is required. The role of the special inspector is to verify that the clamps and standing seam metal roof materials and installation are as described in the evaluation report. In lieu of conducting special inspections, , installation must be done in accordance with S-5! Metal Roof Innovations, Ltd. installation instructions and this report, and a certificate of installation must be provided to the code official by the installer.

## 5.0 CONDITIONS OF USE:

The S-5! Standing Seam Clamps described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

**5.1** The S-5! Standing Seam Clamps must be installed in accordance with this report and the manufacturer's published installation instructions. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.

**5.2** Calculations showing compliance with this report must be submitted to the code official. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

**5.3** Clamps subject to vibrations induced by mechanical equipment are outside the scope of this evaluation report.

**5.4** Special inspection must comply with Section 4.3 of this report.

**5.5** The S-5! clamps are manufactured under quality control programs with inspections by ICC-ES.

## 6.0 EVIDENCE SUBMITTED

**6.1** Connection load test reports.

**6.2** Engineering analyses prepared by a registered design professional

**6.3** Installation instructions.

**6.4** Quality control documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10).

## 7.0 IDENTIFICATION

**7.1** The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-3869) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.

**7.2** In addition, packages of S-5! clamps are identified by a label bearing the product name or designation.

**7.3** The report holder's contact information is the following:

**S-5! METAL ROOF INNOVATIONS, LTD.**
**12740 BLACK FOREST ROAD**
**COLORADO SPRINGS, COLORADO 80908**
**(888) 825-3432**
**www.s-5.com**

**TABLE 1—ALLOWABLE CONNECTION CAPACITY OF THE S-5! CLAMPS TO STANDING SEAM METAL ROOF[1]**

| S-5! Clamps | Standing Seam Metal Roof | | | Installed Torque (in-lbf) | Allowable (ASD) Connection Capacity (lbf) | | Design (LRFD) Connection Capacity (lbf) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Uplift | Lateral | Uplift | Lateral |
| | Manufacturer | Product Designation | Required Yield Strength (ksi) | | Normal to Seam | Parallel to Seam | Normal to Seam | Parallel to Seam |
| S-5-S | A.B. Martin Roofing Supply | ABSeam (24 ga. steel w/ AZ50 and PVDF) | 61.2 | 130-150 | 280 | 605 | 448 | 969 |
| | | ABSeam (26 ga. steel w/ AZ50 and SMP) | 58.4 | 130-150 | 519 | 499 | 830 | 798 |
| S-5-S mini | | ABSeam (24 ga. steel w/ AZ50 and PVDF) | 61.2 | 130-150 | 140 | 396 | 224 | 633 |
| | | ABSeam (26 ga. steel w/ AZ50 and SMP) | 58.4 | 130-150 | 221 | 308 | 354 | 493 |
| S-5-V | | ABSeam (24 ga. steel w/ AZ50 and PVDF) | 61.2 | 130-150 | N/A | 544 | N/A | 871 |
| | | ABSeam (26 ga. steel w/ AZ50 and SMP) | 58.4 | 130-150 | N/A | 433 | N/A | 693 |
| S-5-V mini | | ABSeam (24 ga. steel w/ AZ50 and PVDF) | 61.2 | 130-150 | 207 | N/A | 331 | N/A |
| | | ABSeam (26 ga. steel w/ AZ50 and SMP) | 58.4 | 130-150 | 243 | N/A | 389 | N/A |
| S-5-H | AEP Span | Span-lok hp (0.040” alum. w/PVDF) | 22.0 | 130-150 | 432 | 385 | 691 | 617 |
| S-5-H mini | | Span-lok hp (0.040” alum. w/PVDF) | 22.0 | 130-150 | 183 | 265 | 292 | 424 |
| S-5-H | | Span-lok hp (22 ga. steel w/AZ50 and PVDF) | 55.8 | 160-180 | 452 | 669 | 724 | 1,070 |
| S-5-H mini | | Span-lok hp (22 ga. steel w/AZ50 and PVDF) | 55.8 | 160-180 | 452 | 182 | 724 | 291 |
| S-5-H | | Span-lok hp (24 ga. steel w/AZ50 and PVDF) | 63.0 | 130-150 | 559 | 707 | 895 | 1,131 |
| S-5-H mini | | Span-lok hp (24 ga. steel w/AZ50 and PVDF) | 63.0 | 130-150 | 559 | 419 | 895 | 670 |
| S-5-H | | Span-lok (22 ga. steel w/AZ50 and PVDF) | 56.7 | 160-180 | 901 | 456 | 1,441 | 730 |
| S-5-H mini | | Span-lok (22 ga. steel w/AZ50 and PVDF) | 56.7 | 160-180 | 846 | 182 | 1,353 | 291 |
| S-5-H | | Span-lok (24 ga. steel w/AZ50 and PVDF) | 67.3 | 130-150 | 421 | 388 | 673 | 621 |
| S-5-H mini | | Span-lok (24 ga. steel w/AZ50 and PVDF) | 67.3 | 130-150 | 137 | 198 | 220 | 317 |
| S-5-V | | SpanSeam (22 ga. steel w/AZ50 and PVDF) | 55.2 | 160-180 | 972 | 619 | 1,555 | 991 |
| S-5-V mini | | SpanSeam (22 ga. steel w/AZ50 and PVDF) | 55.2 | 160-180 | 284 | 184 | 455 | 294 |
| S-5-V | | SpanSeam (24 ga. steel w/AZ50 and PVDF) | 61.7 | 130-150 | 1,399 | 363 | 2,238 | 580 |
| S-5-V mini | | SpanSeam (24 ga. steel w/AZ50 and PVDF) | 61.7 | 130-150 | 616 | 363 | 985 | 580 |
| S-5-B | Arapahoe Roofing & Sheet Metal, Inc. | 1” SnapLock (16 oz. copper) | 28.8 | 130-150 | 261 | 125 | 418 | 200 |
| S-5-B mini | | 1” SnapLock (16 oz. copper) | 28.8 | 130-150 | 110 | 76 | 176 | 122 |
| S-5-S | AEP Span/ASC Building Products | Design Span hp (22 ga. steel w/AZ50 and PVDF) | 54.0 | 160-180 | 618 | 588 | 988 | 940 |
| S-5-S mini | | Design Span hp (22 ga. steel w/AZ50 and PVDF) | 54.0 | 160-180 | 242 | 110 | 387 | 177 |
| S-5-S | | Design Span hp (24 ga. steel w/AZ50 and PVDF) | 57.2 | 130-150 | 394 | 573 | 630 | 916 |
| S-5-S mini | | Design Span hp (24 ga. steel w/AZ50 and PVDF) | 57.2 | 130-150 | 287 | 187 | 460 | 300 |
| S-5-N | ASC Building Products | Skyline (24 ga. steel w/AZ50 and PVDF) | 63.0 | 130-150 | 509 | 80 | 815 | 129 |
| S-5-N mini | | Skyline (24 ga. steel w/AZ50 and PVDF) | 63.0 | 130-150 | 395 | 53 | 632 | 85 |
| S-5-N | | Skyline (26 ga. steel w/ AZ50 and PVDF) | 48.4 | 130-150 | N/A | 325 | N/A | 520 |
| S-5-N | | Skyline (26 ga. steel w/AZ50 and SMP) | 55.3 | 130-150 | 379 | 196 | 606 | 313 |
| S-5-N mini | | Skyline (26 ga. steel w/AZ50 and SMP) | 55.3 | 130-150 | 337 | N/A | 539 | N/A |

**TABLE 1—ALLOWABLE CONNECTION CAPACITY OF THE S-5! CLAMPS TO STANDING SEAM METAL ROOF[1] (Continued)**

| S-5! Clamps | Standing Seam Metal Roof | | | Installed Torque (in-lbf) | Allowable (ASD) Connection Capacity (lbf) | | Design (LRFD) Connection Capacity (lbf) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Uplift | Lateral | Uplift | Lateral |
| | Manufacturer | Product Designation | Required Yield Strength (ksi) | | Normal to Seam | Parallel to Seam | Normal to Seam | Parallel to Seam |
| S-5-E | Astron Buildings | LMR 600 (0.66 mm steel w/AZ185) | 52.0 | 130-150 | 1079 | 671 | 1,727 | 1,074 |
| S-5-E mini | | LMR 600 (0.66 mm steel w/AZ185) | 52.0 | 130-150 | 834 | 319 | 1,335 | 511 |
| S-5-H mini | All Weather Insulated Panels | SR2 SF (26 ga. 304 2B Stainless Steel) | 45.4 | 130-150 | N/A | 264 | N/A | 423 |
| S-5-N | Bridger Steel | SL-16 (24 ga. steel w/ PVDF and AZ50) | 56.3 | 130-150 | N/A | 494 | N/A | 790 |
| | | SL-16 (26 ga. steel w/ PVDF and AZ50) | 45.1 | 130-150 | N/A | 416 | N/A | 666 |
| S-5-N mini | | SL-16 (24 ga. steel w/ PVDF and AZ50) | 56.3 | 130-150 | 368 | N/A | 588 | N/A |
| | | SL-16 (26 ga. steel w/ PVDF and AZ50) | 45.1 | 130-150 | 227 | N/A | 363 | N/A |
| S-5-S | | Tru-Snap(24 ga. steel w/ PVDF and AZ50) | 57.1 | 130-150 | N/A | 417 | N/A | 667 |
| | | Tru-Snap(26 ga. steel w/ PVDF and AZ50) | 45.8 | 130-150 | N/A | 459 | N/A | 735 |
| S-5-N | The Bryer Company | TBC-Proseam (24 ga. steel w/ PVDF and AZ55) | 53.5 | 130-150 | 827 | 451 | 1,342 | 721 |
| | | TBC-Proseam (26 ga. steel w/ PVDF and AZ55) | 56.8 | 130-150 | 526 | 312 | 841 | 499 |
| S-5-N mini | | TBC-Proseam (24 ga. steel w/ PVDF and AZ55) | 53.5 | 130-150 | 553 | 128 | 884 | 205 |
| | | TBC-Proseam (26 ga. steel w/ PVDF and AZ55) | 56.8 | 130-150 | 377 | 237 | 603 | 377 |
| S-5-N 1.5 | | TBC-Truloc (24 ga. steel w/ PVDF and AZ55) | 45.8 | 130-150 | 577 | 344 | 924 | 551 |
| | | TBC-Truloc (26 ga. steel w/ PVDF and AZ55) | 53.5 | 130-150 | 419 | 293 | 670 | 469 |
| S-5-N 1.5 mini | | TBC-Truloc (24 ga. steel w/ PVDF and AZ55) | 45.8 | 130-150 | 526 | 76 | 842 | 121 |
| | | TBC-Truloc (26 ga. steel w/ PVDF and AZ55) | 53.5 | 130-150 | 328 | 237 | 525 | 380 |
| S-5-N | Central Texas Metal Roofing Supply (CTMRS) | ProSnap 100 (24 ga. steel w/ Galvalume) | 41.0 | 130-150 | 339 | 342 | 542 | 547 |
| S-5-N mini | | ProSnap 100 (24 ga. steel w/ Galvalume) | 41.0 | 130-150 | 253 | 121 | 404 | 193 |
| S-5-T | Dimensional Metals, Inc. (DMI) | TL25 (24 ga. steel w/ AZ & PVDF) | 54.1 | 130-150 | 1,228 | 705 | 1,965 | 1,127 |
| S-5-T mini | | TL25 (24 ga. steel w/ AZ & PVDF) | 54.1 | 130-150 | 739 | 277 | 1,182 | 443 |
| S-5-H | Dynamic Metals | DM1500 (24 ga. steel) | 47.1 | 130-150 | 657 | 172 | 1051 | 275 |
| S-5-H mini | | DM1500 (24 ga. steel) | 47.1 | 130-150 | 477 | 170 | 763 | 272 |
| S-5-H | | DM1500 (0.032 in aluminum) | 18.7 | 130-150 | 334 | 346 | 535 | 554 |
| S-5-H mini | | DM1500 (0.032 in aluminum) | 18.7 | 130-150 | 152 | 255 | 244 | 408 |
| S-5-S | | DM1700 (0.032 in aluminum) | 18.7 | 130-150 | 509 | 414 | 815 | 663 |
| S-5-S mini | | DM1700 (0.032 in aluminum) | 18.7 | 130-150 | 198 | 235 | 317 | 377 |
| S-5-N mini | Englert | A1101 (0.04 inch Aluminum w/ PVDF) | 26.4 | 130-150 | 193 | N/A | 308 | N/A |

**TABLE 1—ALLOWABLE CONNECTION CAPACITY OF THE S-5! CLAMPS TO STANDING SEAM METAL ROOF[1] (Continued)**

| S-5! Clamps | Standing Seam Metal Roof | | | Installed Torque (in-lbf | Allowable (ASD) Connection Capacity (lbf) | | Design (LRFD) Connection Capacity (lbf) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Uplift | Lateral | Uplift | Lateral |
| | Manufacturer | Product Designation | Required Yield Strength (ksi) | | Normal to Seam | Parallel to Seam | Normal to Seam | Parallel to Seam |
| S-5-S | Extreme Metal Fabricators | PeakMax (24 ga. w/ AZ-50) | 53.6 | 130-150 | 364 | 350 | 582 | 561 |
| S-5-S mini | | PeakMax (24 ga. w/ AZ-50) | 53.6 | 130-150 | N/A | 316 | N/A | 506 |
| S-5-S | | PeakMax (24 ga. w/ AZ-55) | 42.6 | 130-150 | 653 | 151 | 1044 | 242 |
| S-5-S mini | | PeakMax (24 ga. w/ AZ-55) | 42.6 | 130-150 | 356 | 197 | 570 | 315 |
| S-5-S | | PeakMax (0.032 in aluminum w/PVDF) | 13.3 | 130-150 | 166 | 224 | 266 | 358 |
| S-5-S mini | | PeakMax (0.032 in aluminum w/PVDF) | 13.3 | 130-150 | 291 | 333 | 465 | 533 |
| S-5-H | FALK | Standing Seam SF (24 ga. steel) | 33.7 | 130-150 | 789 | 372 | 1263 | 596 |
| S-5-H mini | | Standing Seam SF (24 ga. steel) | 33.7 | 130-150 | 522 | 168 | 836 | 270 |
| S-5-T | Garland | R-Mer® Span (22 ga. G90 and PVDF coated steel) | 50.5 | 160-180 | 779 | 1,093 | 1,247 | 1,749 |
| | | R-Mer® Span (0.04 inch Aluminum w/ PVDF coating) | 25.9 | 130-150 | 548 | 775 | 877 | 1,240 |
| | | R-Mer® Span (24 ga. G90 and PVDF coated steel) | 52.3 | 130-150 | 685 | 505 | 1,097 | 808 |
| S-5-T mini | | R-Mer® Span (22 ga. G90 and PVDF coated steel) | 50.5 | 160-180 | 671 | 389 | 1,074 | 623 |
| | | R-Mer® Span (0.04 inch Aluminum w/ PVDF coating) | 25.9 | 130-150 | 381 | 575 | 610 | 920 |
| | | R-Mer® Span (24 ga. G90 and PVDF coated steel) | 52.3 | 130-150 | 466 | N/A | 746 | N/A |
| S-5-N 1.5 | Graber Post Buildings | 1.5” Snap Standing Seam (26 ga. steel w/ SMP and AZ50) | 54.6 | 130-150 | N/A | 332 | N/A | 531 |
| S-5-N 1.5 mini | | 1.5” Snap Standing Seam (26 ga. steel w/ SMP and AZ50) | 55.2 | 130-150 | 197 | N/A | 315 | N/A |
| S-5-T | Green Span Profiles | RidgeLine (24 ga. steel w/ PVDF, Galvalume G90) | 52.3 | 130-150 | 1,044 | 650 | 1,670 | 1,039 |
| S-5-H90 | MBCI | BattenLok® HS (22 ga. steel w/ AZ55 & Galvalume Plus) | 54.1 | 160-180 | 1,013 | 687 | 1,621 | 1,099 |
| | | BattenLok® HS (24 ga. steel w/ AZ55 & Galvalume Plus) | 62.3 | 130-150 | 1,029 | 595 | 1,646 | 953 |
| S-5-H90 mini | | BattenLok® HS (22 ga. steel w/ AZ55 & Galvalume Plus) | 54.1 | 160-180 | 944 | 513 | 1,510 | 820 |
| | | BattenLok® HS (24 ga. steel w/ AZ55 & Galvalume Plus) | 62.3 | 130-150 | 756 | 474 | 1,209 | 758 |
| S-5-V | | Ultra-Dek® (22 ga. steel w/ AZ55 & Galvalume Plus) | 54.0 | 160-180 | 1,204 | 548 | 1,927 | 876 |
| | | Ultra-Dek® (24 ga. steel w/ AZ55 & Galvalume Plus) | 54.8 | 130-150 | 482 | 600 | 772 | 961 |
| | | SuperLok® (22 ga. steel w/ AZ55 & Galvalume Plus) | 54.0 | 160-180 | 1,169 | 830 | 1,870 | 1,328 |
| | | SuperLok® (24 ga. steel w/ AZ55 & Galvalume Plus) | 63.2 | 130-150 | 1,137 | 660 | 1,819 | 1,057 |
| | | Double-Lok® (22 ga. steel w/ AZ55 & Galvalume Plus) | 55.2 | 160-180 | 909 | 955 | 1,455 | 1,528 |
| | | Double-Lok® (24 ga. steel w/ AZ55 & Galvalume Plus) | 60.1 | 130-150 | 1,158 | 846 | 1,852 | 1,354 |

**TABLE 1—ALLOWABLE CONNECTION CAPACITY OF THE S-5! CLAMPS TO STANDING SEAM METAL ROOF[1] (Continued)**

| S-5! Clamps | Standing Seam Metal Roof | | | Installed Torque (in-lbf) | Allowable (ASD) Connection Capacity (lbf) | | Design (LRFD) Connection Capacity (lbf) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Uplift | Lateral | Uplift | Lateral |
| | Manufacturer | Product Designation | Required Yield Strength (ksi) | | Normal to Seam | Parallel to Seam | Normal to Seam | Parallel to Seam |
| S-5-V mini | MBCI | Ultra-Dek® (22 ga. steel w/ AZ55 & Galvalume Plus) | 54.0 | 160-180 | 811 | 131 | 1,298 | 289 |
| | | Ultra-Dek® (24 ga. steel w/ AZ55 & Galvalume Plus) | 54.8 | 130-150 | 384 | 292 | 614 | 566 |
| | | SuperLok® (22 ga. steel w/ AZ55 & Galvalume Plus) | 54.0 | 160-180 | 1,008 | 568 | 1,613 | 908 |
| | | SuperLok® (24 ga. steel w/ AZ55 & Galvalume Plus) | 63.2 | 130-150 | 838 | 460 | 1,340 | 736 |
| | | Double-Lok® (22 ga. steel w/ AZ55 & Galvalume Plus) | 55.2 | 160-180 | 1,032 | 644 | 1,652 | 1,030 |
| | | Double-Lok® (24 ga. steel w/ AZ55 & Galvalume Plus) | 60.1 | 130-150 | 619 | 550 | 990 | 879 |
| S-5-S | | LokSeam® (22 ga. steel w/ AZ55 & Galvalume Plus) | 53.1 | 160-180 | 779 | 838 | 1,247 | 1,341 |
| | | LokSeam® (24 ga. steel w/ AZ55 & Galvalume Plus) | 54.5 | 130-150 | 644 | 634 | 1,030 | 1,014 |
| S-5-S mini | | LokSeam® (22 ga. steel w/ AZ55 & Galvalume Plus) | 53.1 | 160-180 | 376 | 581 | 602 | 929 |
| | | LokSeam® (24 ga. steel w/ AZ55 & Galvalume Plus) | 54.5 | 130-150 | 235 | 476 | 376 | 761 |
| S-5-N | McElroy Metals | Meridian (24 ga. steel w/ PVDF and Galvalume AZ50) | 58.0 | 130-150 | 511 | 416 | 817 | 666 |
| | | Meridian (26 ga. steel w/ PVDF and Galvalume AZ50) | 50.2 | 130-150 | 352 | 357 | 563 | 570 |
| S-5-N mini | | Meridian (24 ga. steel w/ PVDF and Galvalume AZ50) | 58.0 | 130-150 | 384 | 335 | 615 | 536 |
| | | Meridian (26 ga. steel w/ PVDF and Galvalume AZ50) | 50.2 | 130-150 | 188 | 247 | 301 | 394 |
| S-5-T | | 238T (0.032 Aluminum w/ PVDF) | 19.8 | 130-150 | 626 | 384 | 1003 | 615 |
| S-5-T mini | | 238T (0.032 Aluminum w/ PVDF) | 19.8 | 130-150 | 450 | 317 | 720 | 507 |
| S-5-T | | 238T (0.040 Aluminum w/ PVDF) | 13.6 | 130-150 | 531 | 618 | 850 | 990 |
| S-5-T mini | | 238T (0.040 Aluminum w/ PVDF) | 13.6 | 130-150 | 440 | 332 | 704 | 532 |
| S-5-V | Merchant & Evans | ZipLock 2” (22 ga. steel w/ PVDF and AZ55) | 52.9 | 160-180 | 1,218 | 635 | 1,949 | 1,016 |
| | | ZipLock 2” (24 ga. steel w/ PVDF and AZ55) | 53.6 | 130-150 | 904 | 718 | 1,447 | 1,149 |
| | | Ziplock 2” (0.040 inch Aluminum w/ PVDF) | 20.4 | 130-150 | N/A | 458 | N/A | 733 |
| | | Ziplock 2” (0.032 inch Aluminum w/ PVDF) | 25.0 | 130-150 | N/A | 501 | N/A | 801 |
| S-5-V mini | | ZipLock 2” (22 ga. steel w/ PVDF and AZ55) | 52.9 | 160-180 | 951 | 522 | 1,521 | 835 |
| | | ZipLock 2” (24 ga. steel w/ PVDF and AZ55) | 53.6 | 130-150 | 505 | 390 | 808 | 623 |
| | | ZipLock 2” (0.040 inch Aluminum w/ PVDF) | 20.4 | 130-150 | 390 | 514 | 624 | 823 |
| | | ZipLock 2” (0.032 inch Aluminum w/ PVDF) | 25.0 | 130-150 | 349 | 380 | 558 | 608 |

**TABLE 1—ALLOWABLE CONNECTION CAPACITY OF THE S-5! CLAMPS TO STANDING SEAM METAL ROOF[1] (Continued)**

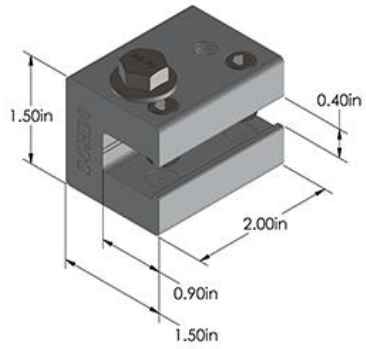
| S-5! Clamps | Standing Seam Metal Roof | | | Installed Torque (in-lbf) | Allowable (ASD) Connection Capacity (lbf) | | Design (LRFD) Connection Capacity (lbf) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Uplift | Lateral | Uplift | Lateral |
| | Manufacturer | Product Designation | Required Yield Strength (ksi) | | Normal to Seam | Parallel to Seam | Normal to Seam | Parallel to Seam |
| S-5-E | Merchant & Evans | ZipLock 1.5” (0.040 inch Aluminum w/ PVDF) | 20.0 | 130-150 | 358 | 519 | 572 | 831 |
| | | ZipLock 1.5” (0.032 inch Aluminum w/ PVDF) | 25.0 | 130-150 | N/A | 466 | N/A | 746 |
| S-5-E mini | | ZipLock 1.5” (0.040 inch Aluminum w/ PVDF) | 20.0 | 130-150 | 402 | N/A | 643 | N/A |
| | | ZipLock 1.5” (0.032 inch Aluminum w/ PVDF) | 25.0 | 130-150 | 433 | 401 | 693 | 642 |
| S-5-Z | | Zip Rib (20 ga. steel w/ AZ55 & PVDF) | 50.6 | 160-180 | 1,211 | 900 | 1,938 | 1,441 |
| | | Zip Rib (22 ga. steel w/ AZ55 & PVDF) | 51.4 | 160-180 | 997 | 837 | 1,595 | 1,339 |
| | | Zip Rib (24 ga. steel w/ AZ55 & PVDF) | 51.9 | 130-150 | 577 | 683 | 923 | 1,093 |
| | | Zip Rib (0.050 inch Aluminum w/ PVDF) | 31.2 | 130-150 | 936 | 891 | 1,497 | 1,426 |
| | | Zip Rib (0.040 inch Aluminum w/ PVDF) | 30.4 | 130-150 | 788 | 778 | 1,261 | 1,245 |
| | | Zip Rib (0.032 inch Aluminum w/ PVDF) | 29.7 | 130-150 | 647 | 374 | 1,035 | 598 |
| S-5-Z mini | | Zip Rib (20 ga. steel w/ AZ55 & PVDF) | 50.6 | 160-180 | 557 | 732 | 891 | 1,171 |
| | | Zip Rib (22 ga. steel w/ AZ55 & PVDF) | 51.4 | 160-180 | 554 | N/A | 886 | N/A |
| | | Zip Rib (24 ga. steel w/ AZ55 & PVDF) | 51.9 | 130-150 | 456 | N/A | 730 | N/A |
| | | Zip Rib (0.050 inch Aluminum w/ PVDF) | 31.2 | 130-150 | 441 | 616 | 705 | 985 |
| | | Zip Rib (0.040 inch Aluminum w/ PVDF) | 30.4 | 130-150 | 497 | 591 | 797 | 945 |
| | | Zip Rib (0.032 inch Aluminum w/ PVDF) | 29.7 | 130-150 | 330 | 523 | 527 | 837 |
| S-5-U | Metal Sales Manufacturing | Magna-Loc 180 [DBF] (24 ga. steel with AZ50) | 50.0 | 130-150 | 1,069 | 841 | 1,710 | 1,346 |
| S-5-U mini | | Magna-Loc 180 [DBF] (24 ga. steel with AZ50) | 50.0 | 130-150 | 655 | 635 | 1,048 | 1,016 |
| S-5-N | | Image II (26 ga. steel) | 53.8 | 130-150 | 356 | 298 | 569 | 477 |
| S-5-N mini | | Image II (26 ga. steel) | 53.8 | 130-150 | 222 | 248 | 356 | 397 |
| S-5-H | | MagnaLoc 90 Deg (24 ga. steel) | 62.2 | 130-150 | 261 | 388 | 417 | 621 |
| S-5-H mini | | MagnaLoc 90 Deg (24 ga. steel) | 62.2 | 130-150 | 304 | 171 | 487 | 273 |
| S-5-V | Morin | SLR-17 (0.032 in aluminum) | 20.5 | 130-150 | 706 | 476 | 1129 | 762 |
| S-5-V mini | | SLR-17 (0.032 in aluminum) | 20.5 | 130-150 | 512 | 368 | 819 | 589 |
| S-5-N | New Tech Machinery | FF100 (24 ga. steel with Galvalume & PVDF) | 60.8 | 130-150 | 336 | 404 | 537 | 647 |
| S-5-N 1.5 | Ottawa Valley Metal | OVM Easy Snap (24 ga. steel) | 43.1 | 130-150 | 73 | N/A | 117 | N/A |
| S-5-N 1.5 mini | | OVM Easy Snap (24 ga. steel) | 43.1 | 130-150 | N/A | 211 | N/A | 338 |
| S-5-N | Sheet Metal Supply | NS-1 (24 ga. steel with G90 & PVDF) | 45.8 | 130-150 | 562 | 480 | 899 | 768 |
| S-5-N mini | | NS-1 (24 ga. steel with G90 & PVDF) | 45.8 | 130-150 | 282 | 277 | 451 | 443 |

**TABLE 1—ALLOWABLE CONNECTION CAPACITY OF THE S-5! CLAMPS TO STANDING SEAM METAL ROOF[1] (Continued)**

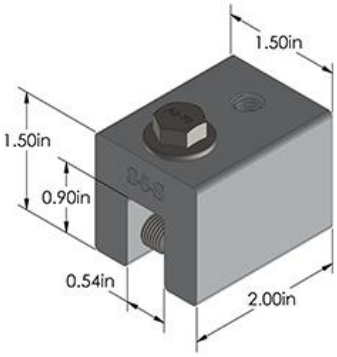
| S-5! Clamps | Standing Seam Metal Roof | | | Installed Torque (in-lbf) | Allowable (ASD) Connection Capacity (lbf) | | Design (LRFD) Connection Capacity (lbf) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Uplift | Lateral | Uplift | Lateral |
| | Manufacturer | Product Designation | Required Yield Strength (ksi) | | Normal to Seam | Parallel to Seam | Normal to Seam | Parallel to Seam |
| S-5-H | Taylor Metal | MS200 (22 ga. steel) | 54.5 | 160-180 | N/A | 541 | N/A | 865 |
| S-5-H mini | | MS200 (22 ga. steel) | 54.5 | 160-180 | 716 | N/A | 1146 | N/A |
| S-5-H | | MS200 (24 ga. steel) | 48.4 | 130-150 | 803 | 114 | 1286 | 183 |
| S-5-S | | VersaSpan (22 ga. steel) | 58.4 | 160-180 | N/A | 727 | N/A | 1164 |
| S-5-S mini | | VersaSpan (22 ga. steel) | 58.4 | 160-180 | 377 | N/A | 604 | N/A |
| S-5-S | | VersaSpan (24 ga. steel) | 61.0 | 130-150 | N/A | 336 | N/A | 538 |
| S-5-S mini | | VersaSpan (24 ga. steel) | 61.0 | 130-150 | 252 | N/A | 404 | N/A |
| S-5-T | Vicwest | Tradition 150 w/ clips (22 ga. steel w/ SMP and G90) | 47.1 | 160-180 | N/A | 939 | N/A | 1,503 |
| S-5-S | | Tradition 100 w/ clips (24 ga. steel w/ SMP and G90) | 57.0 | 130-150 | N/A | 331 | N/A | 529 |
| S-5-S mini | | Tradition 100 w/ clips (24 ga. steel w/ SMP and G90) | 57.0 | 130-150 | 75 | N/A | 119 | N/A |
| S-5-N | Westform Metals | Prolok (24 ga. steel with G90) | 42.0 | 130-150 | 461 | 366 | 738 | 585 |
| S-5-N mini | | Prolok (24 ga. steel with G90) | 42.0 | 130-150 | 338 | N/A | 540 | N/A |
| S-5-N | | Prolok (26 ga. steel with G90) | 44.5 | 130-150 | 266 | 321 | 425 | 514 |
| S-5-N mini | | Prolok (26 ga. steel with G90) | 44.5 | 130-150 | 260 | N/A | 417 | N/A |
| S-5-N 1.5 | Woody's Sheet Metal | 1.5" Nail Strip (24 ga.steel) | 49.6 | 130-150 | 390 | 313 | 642 | 502 |
| S-5-N 1.5 mini | | 1.5" Nail Strip (24 ga. steel) | 49.6 | 130-150 | 291 | 176 | 467 | 281 |

For **SI:** 1 ksi = 6.89 MPa; 1 lbf = 4.45 N.

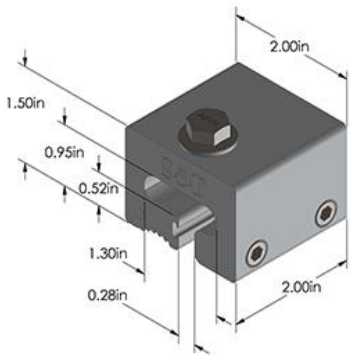
[1]The S-5 clamps must be installed in accordance with Section 4.2 of this report.



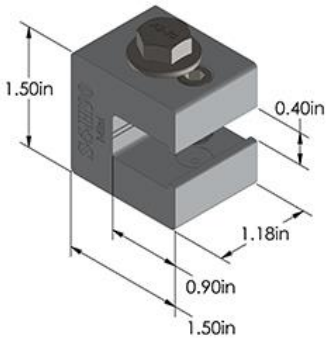

S-5-H90 Clamp



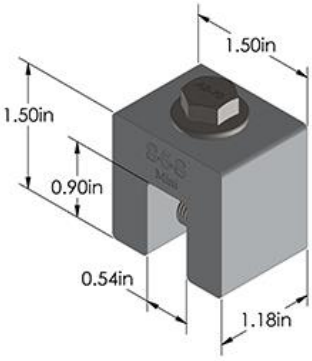

S-5-S Clamp



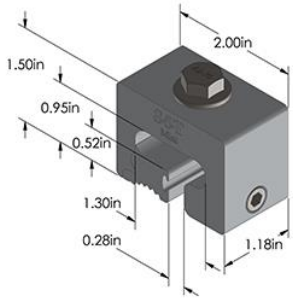

S-5-T Clamp



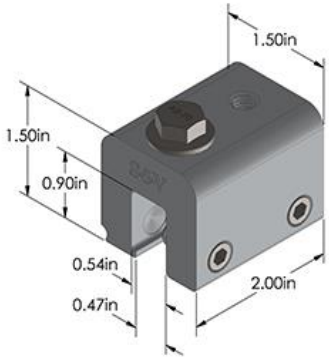

S-5-H90 Mini Clamp



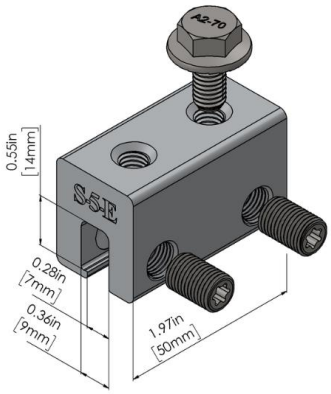

S-5-S Mini Clamp



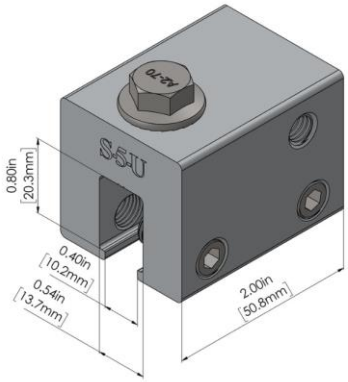

S-5-T Mini Clamp



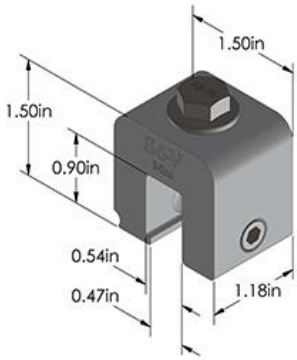

S-5-V Clamp



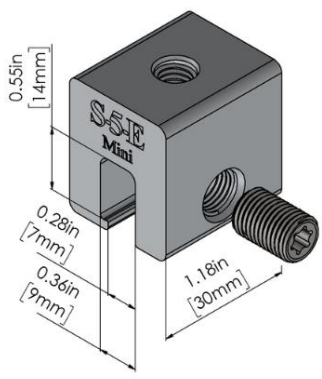

S-5-E Clamp



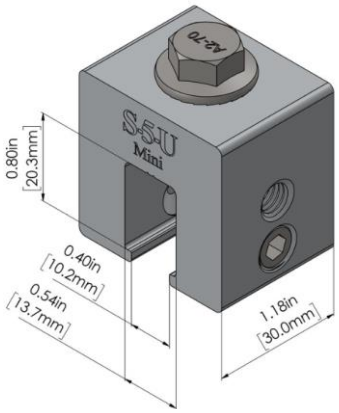

S-5-U Clamp




S-5-V Mini Clamp

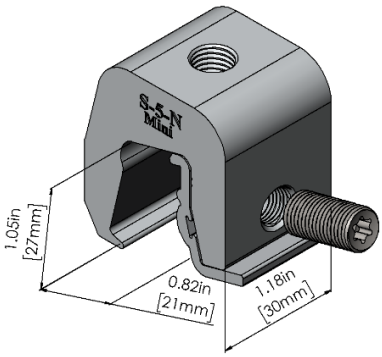



S-5-E Mini Clamp

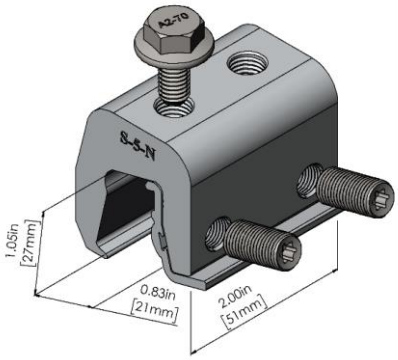



S-5-U Mini Clamp

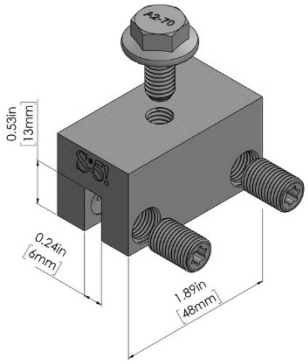
**FIGURE 1—S-5! CLAMP CONFIGURATIONS**



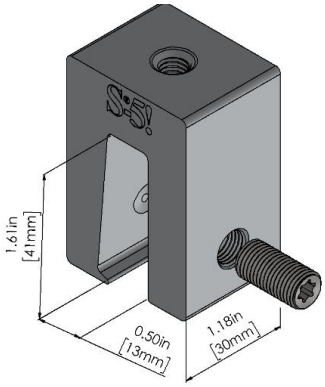

S-5-N Mini Clamp



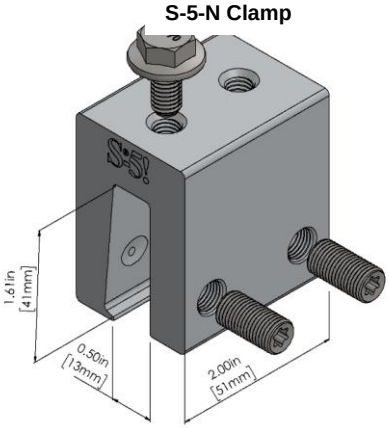

S-5-N Clamp



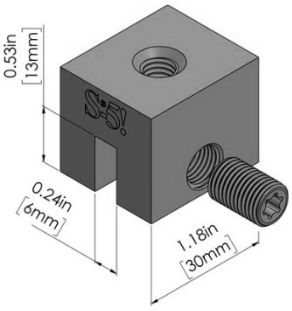

S-5-B Clamp



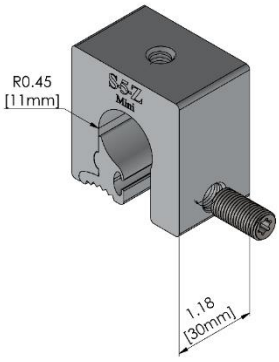

S-5-N 1.5 Mini Clamp



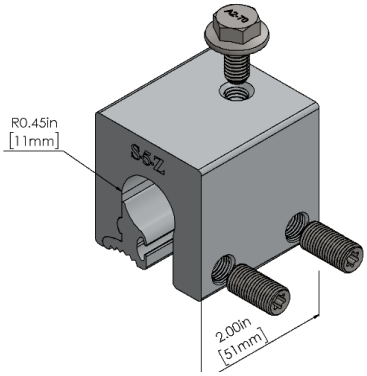

S-5-N 1.5 Clamp



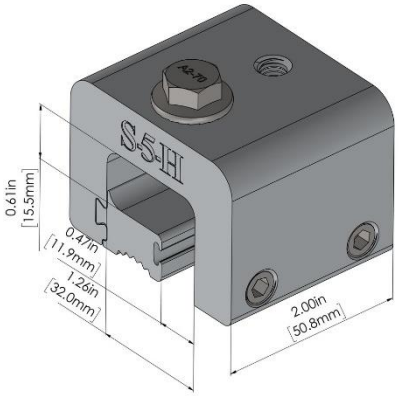

S-5-B Mini Clamp



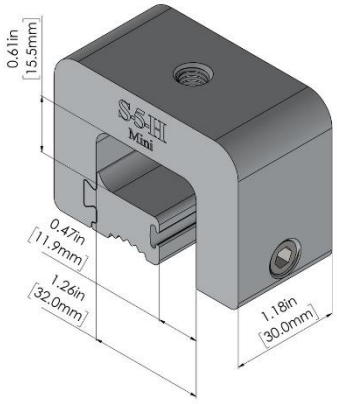

S-5-Z Mini Clamp




S-5-Z Clamp




S-5-H Clamp




S-5-H Mini Clamp

**FIGURE 1—S-5! CLAMP CONFIGURATIONS (Continued)**

**DIVISION: 05 00 00—METALS**
**Section: 05 05 23—METAL FASTENINGS**

**REPORT HOLDER:**

**S-5! METAL ROOF INNOVATIONS, LTD.**

**EVALUATION SUBJECT:**

**S-5! STANDING SEAM CLAMPS**

## 1.0 REPORT PURPOSE AND SCOPE

**Purpose:**

The purpose of this evaluation report supplement is to indicate that S-5! Standing Seam Clamps, described in ICC-ES evaluation report ESR-3869, have also been evaluated for compliance with the codes noted below.

**Applicable code edition*(s)*:**

- 2022 *California Building Code* (CBC)
- 2022 *California Residential Code* (CRC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

## 2.0 CONCLUSIONS

### 2.1 CBC:

The S-5! Standing Seam Clamps, described in Sections 2.0 through 7.0 of the evaluation report ESR-3869, comply with CBC Chapter 22, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16, 17 and 22, as applicable.

**2.1.1 OSHPD:** The applicable OSHPD Sections of the CBC are beyond the scope of this supplement.

**2.1.2 DSA:** The applicable DSA Sections of the CBC are beyond the scope of this supplement.

### 2.2 CRC:

The S-5! Standing Seam Clamps, described in Sections 2.0 through 7.0 of the evaluation report ESR-3869, comply with CRC Chapter 3, provided the design and installation are in accordance with the 2021 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued July 2023 and revised January 2025.