# VERIFICATION REPORT

For

## AGI Seismic Products Inc.

5188 Willow Street
Vancouver, BC
V5Z 3R9  Canada

| | |
|---|---|
| Date: | April 13, 2016 |
| Report No.: | 13215-1S |
| Revision No.: | 0 |
| Project No.: | 13215 |
| Model No.: | SFC1, SFC1CF, SFC1S, SFC1E, SFC1CFS, SFC1R |
| Product Type: | Seismic Fixture Clamp |

**Your Partner in Testing and Certification Inc.**

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Phone:  604-247-0444
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*LabTest Certification Inc.*

# LISTING REPORT

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## REPORT

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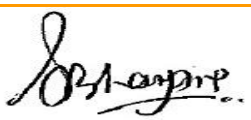
|---|---|
| **Certification System** | ICC-ES Acceptance Criteria for Recessed Lighting Fixtures (Luminaires) in Suspended Ceiling Systems (AC184) |
| **Scope** | This report describes dynamic load test for Seismic Fixture Clamps (SFC) is a metal clamp used to attach a recessed florescent light fixture to a metal suspended ceiling system. The Seismic Fixture Clamp (SFC) is used to provide positive attachment; lateral and vertical restraint of recessed fluorescent light fixtures (luminaires) and ceiling mounted air terminals to framing members of metal suspension systems for acoustical tile and lay-in ceilings. The Seismic Fixture Clamp installed one at each of the four corners of the fixture, reinforces the main runner/cross runner connection, secures the fixture, creating a module where the load is transferred to the four adjacent hanger wires supporting the main runners of the suspended ceiling system from the structure above, whereby, the ceiling compression post and bracing provides the lateral and vertical restraint for the light fixture. |
| **Report reference No.:** | 13215-1S |

**Note: By signing the below, both the Issuer and the Reviewer hereby declare to abide by the applicable LabTest policies:**
**1.) Statement of Independence # 3014 (LabTest Employees), or**
**2.) Independence, Impartiality, and Integrity #1039, clause 11 (Engineering Service Subcontractors).**

| | | |
|---|---|---|
| Complied and Issued by: (print name and signature) | Eugen Rapa |  |
| Date of issue: | April 13, 2016 | |
| Reviewed by: (print name and signature) | Sandeep Bhayana |  |
| Date of Review: | April 13, 2016 | |

| | |
|---|---|
| ☒ **Testing Location** (Name)**:** | Alpha Seismic and Environmental Test Laboratory |
| Address: | 3767 Alpha Way Bellingham, Washington, 98226, USA |
| Testing By: | Al McPhillips |

| | |
|---|---|
| **Applicant's Name:** | AGI Seismic Products Inc. |
| Contact Person: | Frank MacLeod |
| Address: | 5188 Willow Street, Vancouver BC V5Z 3R9 |

| | |
|---|---|
| **Test specification** | |
| Standard (Test Specification) | ➢ ICC-ES Acceptance Criteria for Recessed Lighting Fixtures (Luminaires) in Suspended Ceiling Systems (AC184) |
| **Conclusion** | The submitted test item noted below was found to be in compliance with the above noted standard(s). |

| | |
|---|---|
| **Test item description** .....: | Seismic Fixture Clamp (SFC) |
| Trademark .....: | None |
| Manufacturer .....: | AGI Seismic Products In. |

| Date Issued: | Project No: | Client | Report No: | Revision No: |
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| April 13, 2016 | 13215 | AGI Seismic Products Inc. | 13215-1S | 0 |

| | |
|---|---|
| Address .....: | 20 Hawthorne Point, Little Deer Isle, Maine, USA, 04650 |
| Model and/or Stock No. .....: | ➢ SFC1, SFC1CF, SFC1S, SFC1E, SFC1CFS, SFC1R |
| Rating(s).....: | ➢ The Scismic fixture clamp Weight is 0.2 lbs/piece<br>➢ The Seismic Fixture Clamp Load rating 200 lbs (90.71kg)<br>➢ The maximum fixture (component) weight permitted is 56 lbs (25.4kg) |

| Date Issued: | Project No: | Client | Report No: | Revision No: |
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# GENERAL TERMS

**Test items particulars:** Seismic Fixture Clamps (SFC) is a metal clamp used to attach a recessed florescent light fixture to a metal suspended ceiling system. The Seismic Fixture Clamp (SFC) is used to provide positive attachment, lateral and vertical restraint of recessed fluorescent light fixtures (luminaires) and ceiling mounted air terminals to framing members of metal suspension systems for acoustical tile and lay-in ceilings. The Seismic Fixture Clamp installed one at each of the four corners of the fixture, reinforces the main runner/cross runner connection, secures the fixture, creating a module where the load is transferred to the four adjacent hanger wires supporting the main runners of the suspended ceiling system from the structure above, whereby, the ceiling compression post and bracing provides the lateral and vertical restraint for the light fixture. The SFC 1R Clamp, has no tab on the flange and is used on some box type light fixtures.

Unit shall be installed as per the following standard:

- CISCA 0-2 and CISCA 3&4 **
- 2010 California Building Code (CBC)
- New Zealand Standard NZS 4219
- International Building Code (IBC)
- Uniform Building Code (UBC) **
- National Building Code of Canada
- National Electrical Code
- Canadian Electrical Code
- ASTM E580

**** Subject devices (seismic fixture clamps) comply with the following:**

**ICC EVALUATION SERVICE, INC.**
**AC 184, Clause 4.1.4.2**

**Attachment Devices Used in Lieu of Code Requirements for Two Slack No. 12 Gage Wires Attaching Light Fixtures to the Structure Above the Suspended Ceilings:**

The average ultimate test result, as determined in Section 4.1.1.2, of each test series shall be equal to or greater than 600 pounds (2669 N). The 600-pound (2669 N) value is based on applying a safety factor of 3 to an assumed ultimate load capacity of 100 pounds (444.8 N) for each of the two No. 12 gage slack wires required by the code.

**Possible test case verdicts**

Test case does not apply to the test object : N/A (Not-applicable)
Test item does meet the requirement ..... : Pass (P)
Test item does not meet the requirement .. : Fail (F)

| Date Issued: | Project No: | Client | Report No: | Revision No: |
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**Testing**

☒ **File Transfer, testing conducted by**
Certification Body (CB) ……: ITS Intertek Testing Service ETL SEMKO
Report No. ……: 181273
Report Date ……..: March 10, 2005

**General remarks**

**This report does not permit the use of the LC mark unless provided with Certificate of Conformity and Authorization Letter to Mark issued by LabTest Certification Inc.**

This report shall not be reproduced except in full without the written approval of the testing laboratory.
The test results presented in this report relate only to the item(s) tested.

(see remark #)" refers to a remark appended to the report.
"(see Annex #)" refers to an annex appended to the report.

☐ Throughout this report a comma is used as the decimal separator.
☒ Throughout this report a period is used as the decimal separator.

**Note:** The SFC 1R Clamp, has no tab on the flange and is used on some box type light fixtures.

**Report History:**

- Rev. 0 – Issued April 13, 2016

# ALTERATION

The manufacturer/applicant agrees to complete all below noted alterations prior to shipping and labeling products with the LC Certification Mark:

- Unit shall be marked as with the marking noted in the Marking section.

# NOMENCLATURE

**UBC Symbols:**

The following symbols and notations have the noted meaning in this document:

$C_a$ = Seismic coefficient, as set forth in Table 16-Q of the UBC.

$N_a$ = Near-source factor used in the determination of Ca in Seismic Zone 4, related to the proximity of the building or structure to known faults having magnitudes and slip rates as set forth in Tables 16-S and 16-U of the UBC.

$H_x$ = Equipment attachment elevation with respect to grade. For items at or below the base, $H_x$ shall not be taken to be less than 0.0.

$H_r$ = Building or structure roof elevation with respect to grade.

$R_p$ = Equipment response modification factor. $R_p$ represents the energy absorption capability of the equipment's structure and attachments, set forth in Table 16-O of the UBC.

$I_p$ = Equipment importance factor. $I_p$ represents the greater of the life-safety importance of the component and the hazard exposure importance of the structure, set forth in Table 16-K of the UBC.

**IBC Symbols:**

The following symbols and notations have the noted meaning in this

$S_{DS}$ = Design spectral response acceleration at short period, as determined in Section 1615.1.3 of the IBC.

$z$ = Height of structure (in feet) with respect to grade, at point of attachment of equipment. For items at or below the base, $z$ shall not be taken to be less than 0.0.

$h$ = Average building/structure roof height (in feet) relative to the base elevation.

$R_p$ = Equipment response modification factor. $R_p$ represents the energy absorption capability of the equipment's structure and attachments, set forth in Table 9.6.2.2 or 9.6.3.2 of ASCE 7.

$I_p$ = Equipment importance factor. $I_p$ represents the greater of the life-safety importance factor of the component and the hazard exposure importance factor of the structure, as set forth in Section 9.6.1.5 of ASCE 7.

$A_{RRS}$ = The following symbols and notations have the Spectral acceleration as calculated from design seismic forces, $F_P$, and equipment weight, $W_P$.
$A_{RRS} = F_P / W_P$.

$A_{FLX}$ = Horizontal spectral acceleration calculated for flexible equipment.

$A_{RIG}$ = Horizontal spectral acceleration calculated for rigid equipment.

$a_p$ = In-structure equipment amplification factor. The $a_p$ represents the dynamic amplification of the equipment relative to the fundamental frequency of the building structure.

$F_P$ = Horizontal seismic design force centered at the equipment's center of gravity, and distributed relative to the equipment's mass distribution.

$W_p$ = Equipment operating weight.

# DEFINATIONS:

The following definitions from AC 156 have been repeated here for reference.

**Attachments:** The means by which equipment is secured or restrained by the seismic force resisting system of the building structure. Such attachments and restraints may include anchor bolting, welded connections and mechanical fasteners.

**Biaxial Test:** A dynamic test in which the test specimen is subjected to acceleration in one principal horizontal axis and the vertical axis simultaneously. The horizontal and vertical acceleration components are derived from two different input signals that are phase-incoherent.

**Build-hold-decay (BHD):** The build-hold-decay time interval envelope ($5 + 0/-3$ seconds, $20 + 6/-0$ seconds and $5 + 0/-3$ seconds, respectively) imposed on the drive signal of the shake table to simulate the non stationary nature of an earthquake event. The build time includes time necessary for acceleration ramp-up, the hold time represents the earthquake strong motion time duration, and the decay time includes the de-acceleration ring down time. A straight linear approximation is acceptable.

**Damping:** An energy dissipation mechanism that reduces the amplification and broadens the vibratory response in the region of resonance. Damping is expressed as a percentage of critical damping.

**Flexible Equipment:** Component, including its attachments and force-resisting structural members, having a fundamental period greater than 0.06 second (less than 16.67 Hz).

**Equipment Force-resisting System:** Equipment force-resisting systems are those members or assemblies of members, including braces, frames, struts and attachments, that transmit all loads and forces between the equipment and the building structure. Equipment supports also transmit lateral forces and/or provide structural stability for the connected equipment.

**Octave:** The interval between two frequencies that have a frequency ratio of 2.

**One-third Octave:** Interval between two frequencies that have a frequency ratio of $2^{1/3}$.

**One-sixth Octave:** Interval between two frequencies that have a frequency ratio of $2^{1/6}$.

**Required Response Spectrum (RRS):** The response spectrum generated using the formulas and normalized spectra detailed in Section 6.5.1 of this acceptance criteria. The RRS constitutes a requirement to be met.

**Rigid Equipment:** A component, including its attachments and force-resisting structural members, having a fundamental period less than or equal to 0.06 second (greater than or equal to 16.67 Hz). 3.12 Subassemblies: (To be provided).

**Test Response Spectrum (TRS):** The acceleration response spectrum that is developed from the actual time history of the motion of the shake table test.

**Transmissibility:** The non dimensional ratio of the response amplitude of a system in steady-state forced vibration to the excitation amplitude. The ratio may be one of forces, displacements, velocities, or accelerations and is used to characterize resonant modes of structural vibration.

**Triaxial Test:** A dynamic test in which the test specimen is subjected to acceleration in two principal horizontal axes and the vertical axis simultaneously. The two horizontal and the vertical acceleration components are derived from three different input signals that are phase-incoherent.

**Uniaxial Test:** A dynamic test in which the test specimen is subjected to acceleration in one principal axis. The acceleration components are derived from a single input signal.

**Unit Under Test (UUT):** The equipment item to be qualification-tested.

**Zero Period Acceleration (ZPA):** The peak acceleration of motion time history that corresponds to the high-frequency asymptote on the response spectrum. This acceleration corresponds to the maximum peak acceleration of the time history used to derive the spectrum. For use in this acceptance criteria, the ZPA is assumed to be the acceleration response at 33.3 Hz or greater.

# EXAMPLE MARKING LABEL

**Seismic Fixture Clamp**
**SFC 1**
End View
**ICC-ES AC184**
**LabTest Certification Inc report # 13215**
**AGI Seismic Products Inc**
www.agi-seismic.com
OSHPD OPA-2187-10
US Patent # 5,941,029 & 6,029,414
Bach # A008

**Seismic Fixture Clamp**
**SFC 1E**
**ICC-ES AC184**
**LabTest Certification Inc report # 13215**
**AGI Seismic Products Inc**
www.agi-seismic.com
OSHPD OPA-2187-10
US Patent # 5,941,029 & 6,029,414
Bach # A008

**Seismic Fixture Clamp**
**SFC 1S**
**ICC-ES AC184**
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**Seismic Fixture Clamp**
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**ICC-ES AC184**
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OSHPD OPA-2187-10
US Patent # 5,941,029 & 6,029,414
Bach # A008

# PRODUCT DESCRIPTION

**PRODUCT COVERED: Seismic Fixture Clamp (SFC).**

**PRODUCT DESCRIPTION:**

**1. Seismic Fixture Clamp (SFC) Description:**

The Seismic Fixture Clamp (SFC) is a metal clip used to attach a recessed florescent light fixture to a metal suspended ceiling system. One SFC is used at each of the four corners of the light fixture. The SFC forms a rigid connection of the light fixture to the main runner and the cross runner of the metal suspended is fabricated from No. 20 gage [minimum base-metal thickness of 0.0358 inch (0.91mm)] galvanized steel complying with ASTM A653 SS Grade 33, with a minimum yield and ultimate tensile strengths of 33 and 45 ksi (228 and 310 MPa), respectively. The clamp is cold-formed in several configurations for specific orientation of the luminaire to the main and cross runners of the suspension system and is pre-punched for the fasteners.

**1.1 Fasteners:**

The fasteners used to attach the clamp to the main and cross runners of the suspended ceiling grid are 10-16X3/4-inch-long (19.1 mm) HWH #2 self-drilling, self-taping tech screw. The clip type SFC1, SFC1R, SFS1CF, SFC1CFS have two 4.7mm (0.184”) diameter holes predrilled on the outside of the clip amd two 3.5mm (0.140”) diameter holes predrilled on the inside of the clip to receive the screws. The screws are installed from the outside of the clip through the web of the runners and through the inside of the clip on these three clip types. On the SFC1E, SFC1RE, SFC1S, SFC1RS clip types there is only an outside face that attaches to the runner becase they are installed adjacent clip, through the web of the runner and through the inside of the adjacent clip.

**1.2 Luminaires and Ceiling Mounted Air Terminals:**

The luminaires (light fixtures) and ceiling mounted air terminals must comply with the requirement of the applicable code and must be constructed from a minimum of 0.024-inch-thick (0.61mm) steel complying with ASTM A366, having a minimum yield and ultimate tensile strengths of 26 and 45 ksi (179 and 310 MPa), respectively. The maximum weight of the luminaires and ceiling mounted air terminals are limited to 56 pounds (25.4 kg).

**1.3 Metal Grid Components:**

The main runners and cross runners are formed, respectively, from steel having a minimum uncoated base-metal thickness of 0.013 and 0.010 inch (0.33 and 0.25 mm) and complying with ASTM A653 SS Grade 33. The runners must have a vertical “T” component at least 1 inch (25.4 mm) long and not to exceed a maximum length of 21/2 inches (63.5 mm) and a minimum thickness of 5/16 inch (7.9 mm).

**1.4 Instructions:**

One SFC must be installed over the main and cross runner intersection at each of the four corners of the luminaires in accordance with Figure 2 of this report. Two fasteners must be used to attach each clamp, with one fastener installed through the web of the cross runner and one fastener attached through the web of the main runner.

**2. Seismic Fixture Clamp (SFC):**

- The Scismic fixture clamp Weight is 0.2 lbs/piece
- The Seismic Fixture Clamp Load rating 200 lbs (90.71kg)
- The maximum fixture (component) weight permitted is 56 lbs (25.4kg)

The SFC is used to provide positive attachment of recessed fluorescent light fixtures (luminaires) and ceiling mounted air terminals to framing members of metal suspension systems for acoustical tile and lay-in ceilings complying with the ICC-ES Acceptance Criteria for Attachment Devices for Recessed Lighting Fixtures (Luminaires) in Suspended Ceiling Systems (AC184).

**3. Conditions Of Use:**

Installation of the SFC must comply with this report, the manufacturer's published installation instructions and the applicable code. The manufacturer's published instructions must be available at the jobsite at all times during installation.

Use of the SFC is limited to the attaching recessed fluorescent light fixture (luminaries) and ceiling mounted air terminals to framing members of metal suspension systems for acoustical tile and lay-in ceiling.

## FIGURES / DIAGRAMS

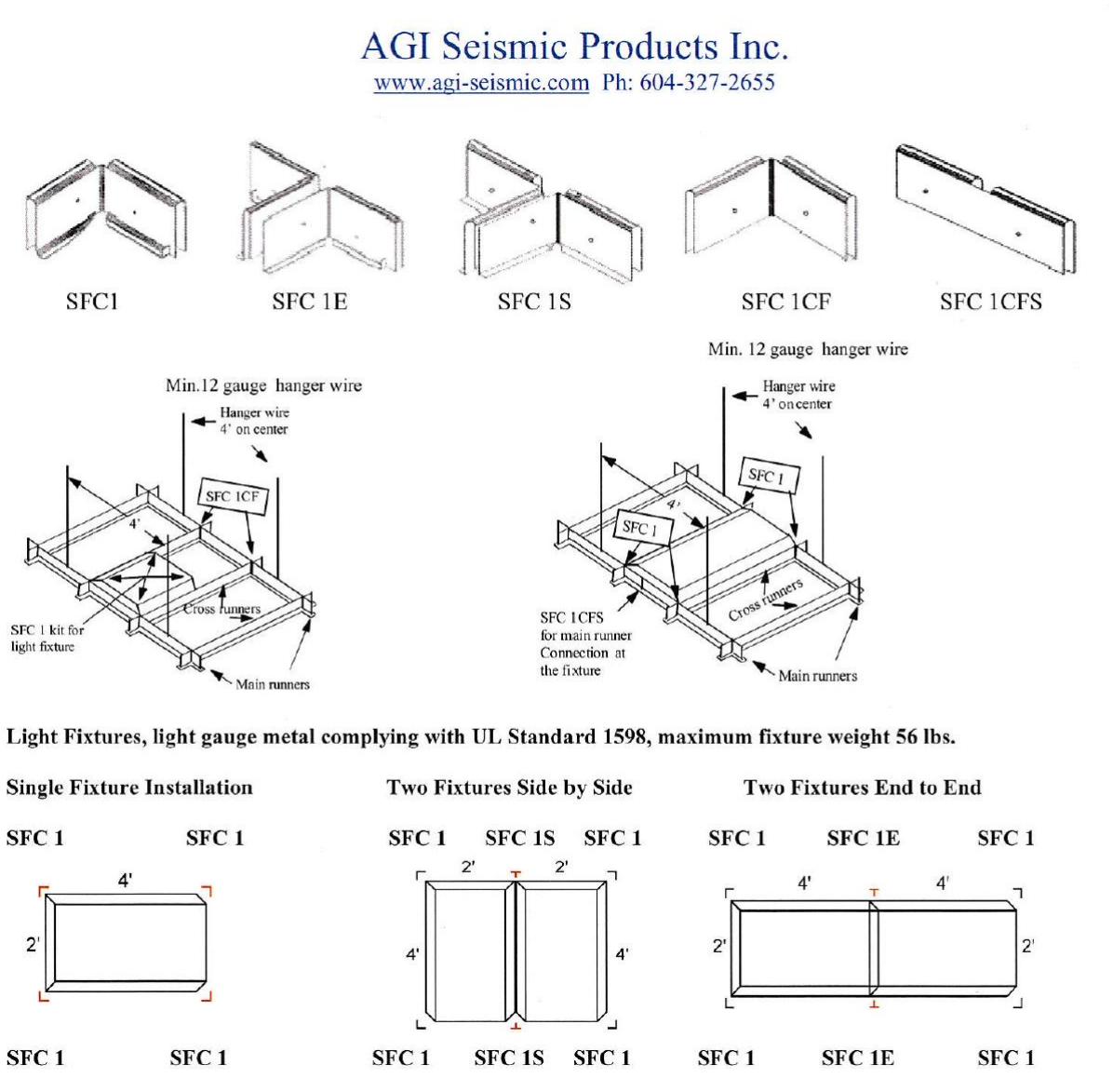



**Figure 1**

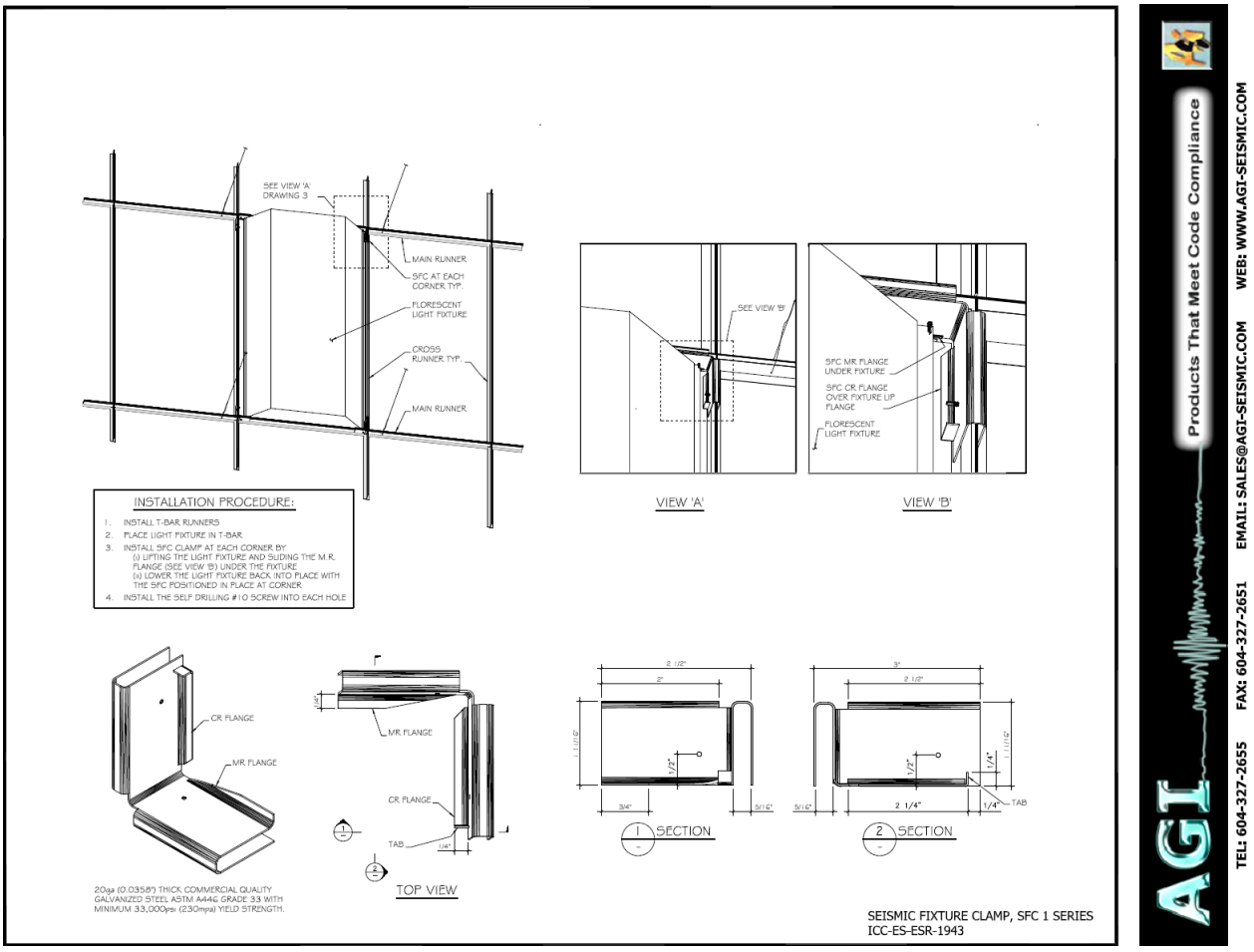
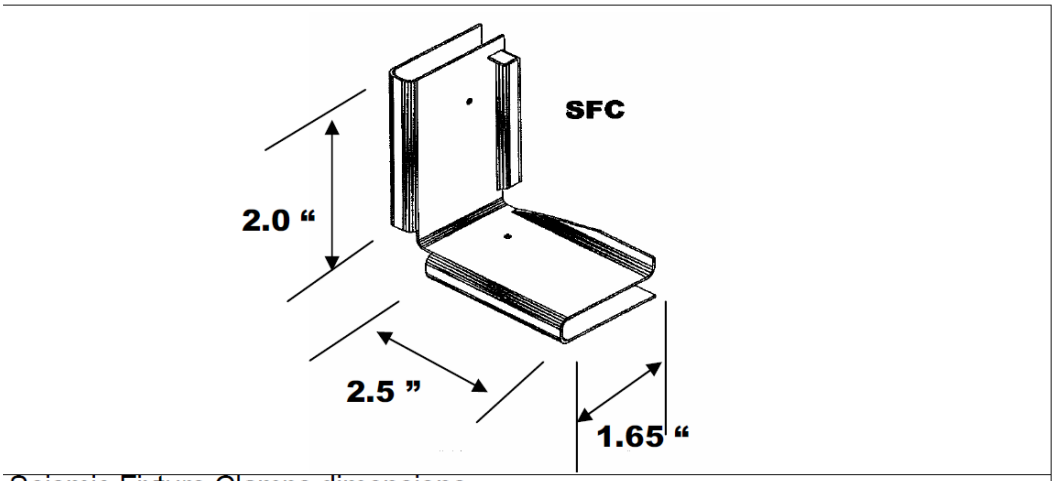


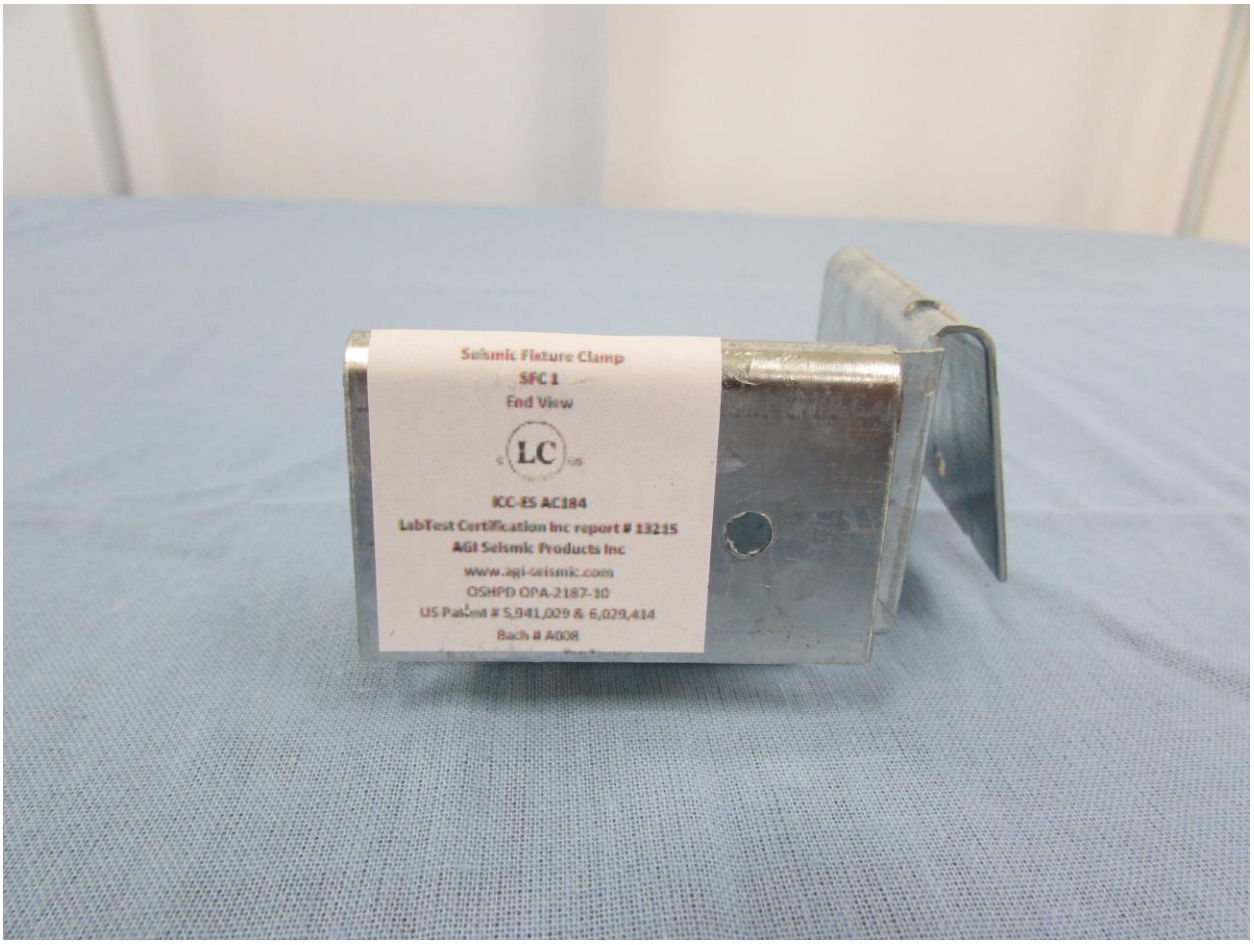

**Figure 2**

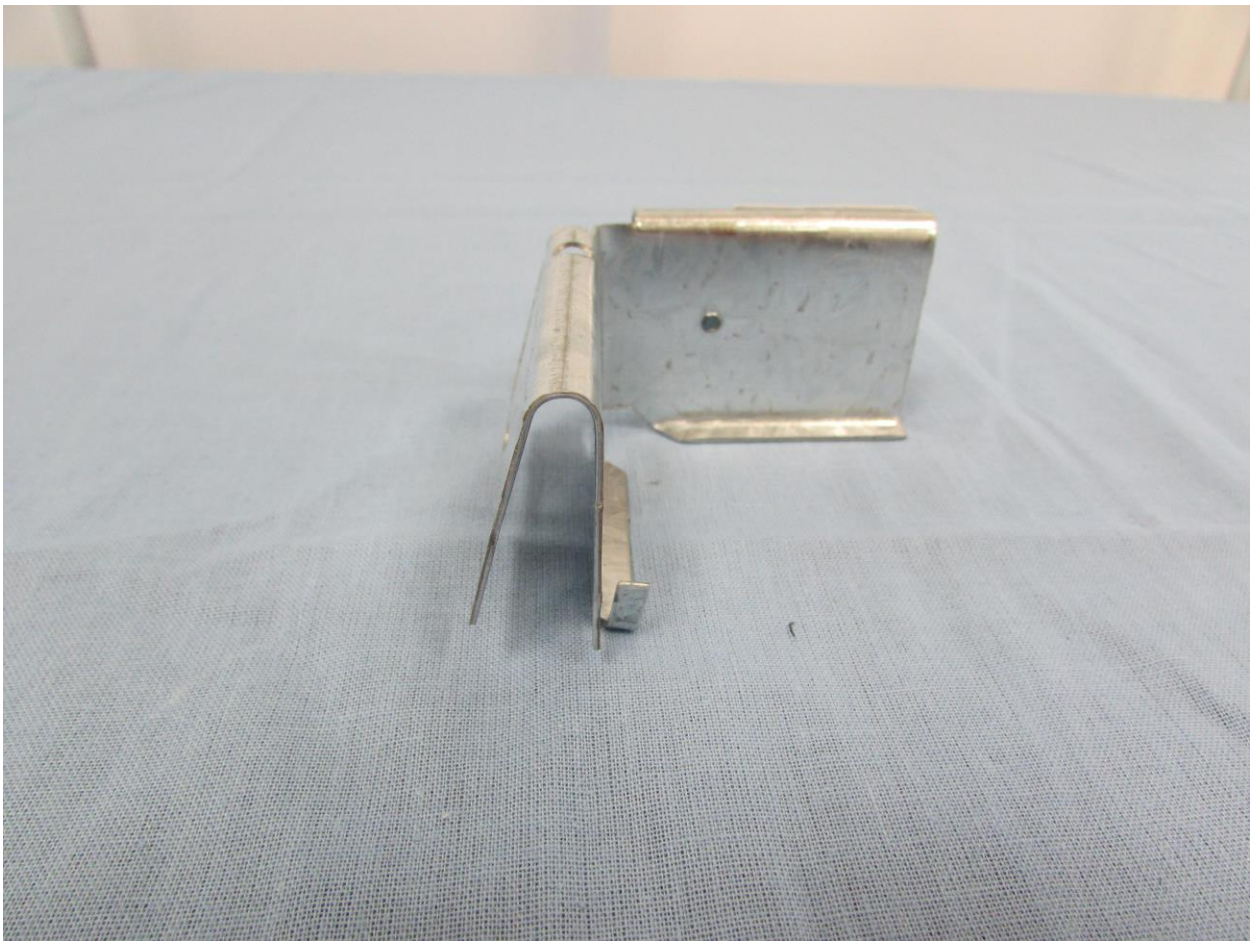


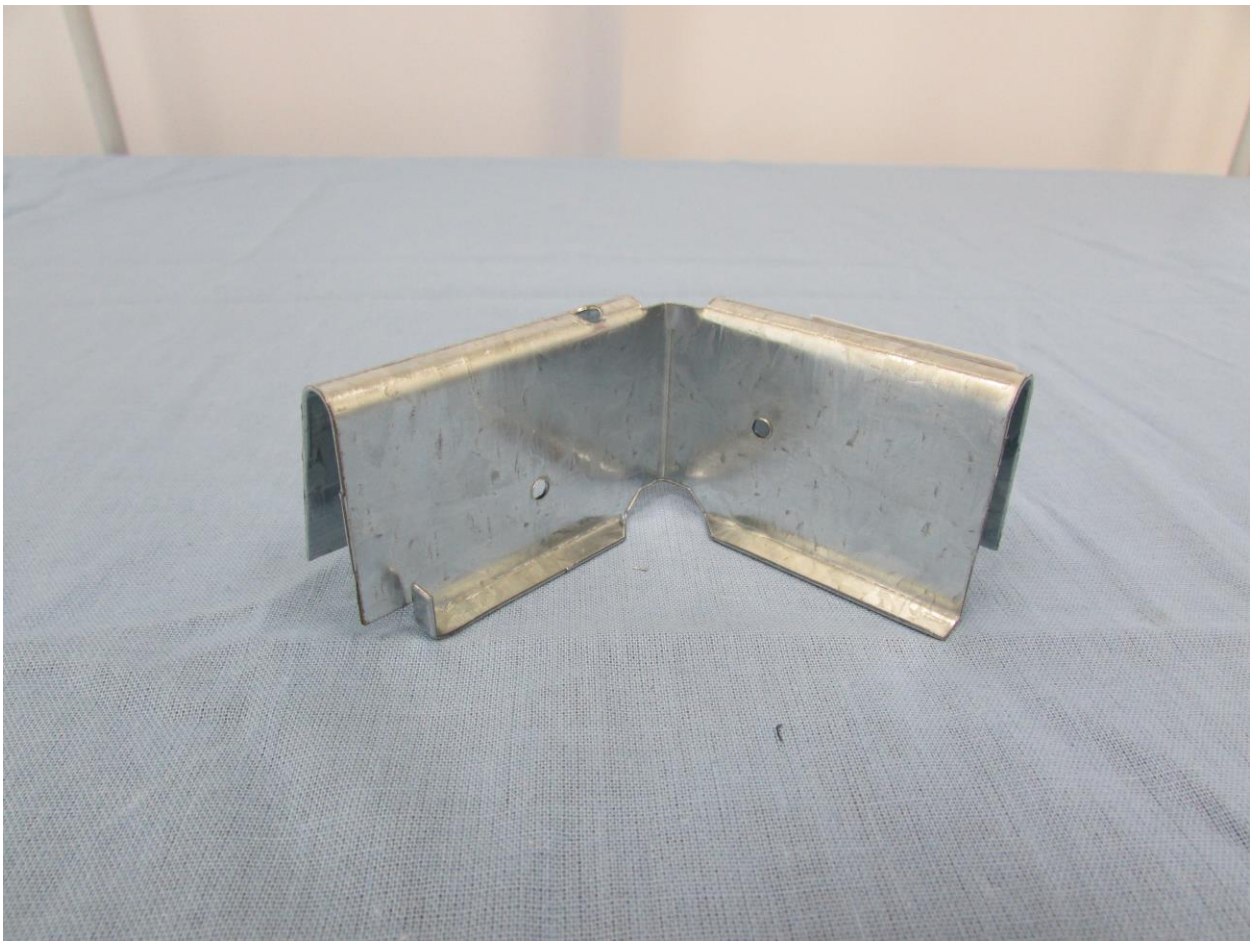

Seismic Fixture Clamps dimensions.

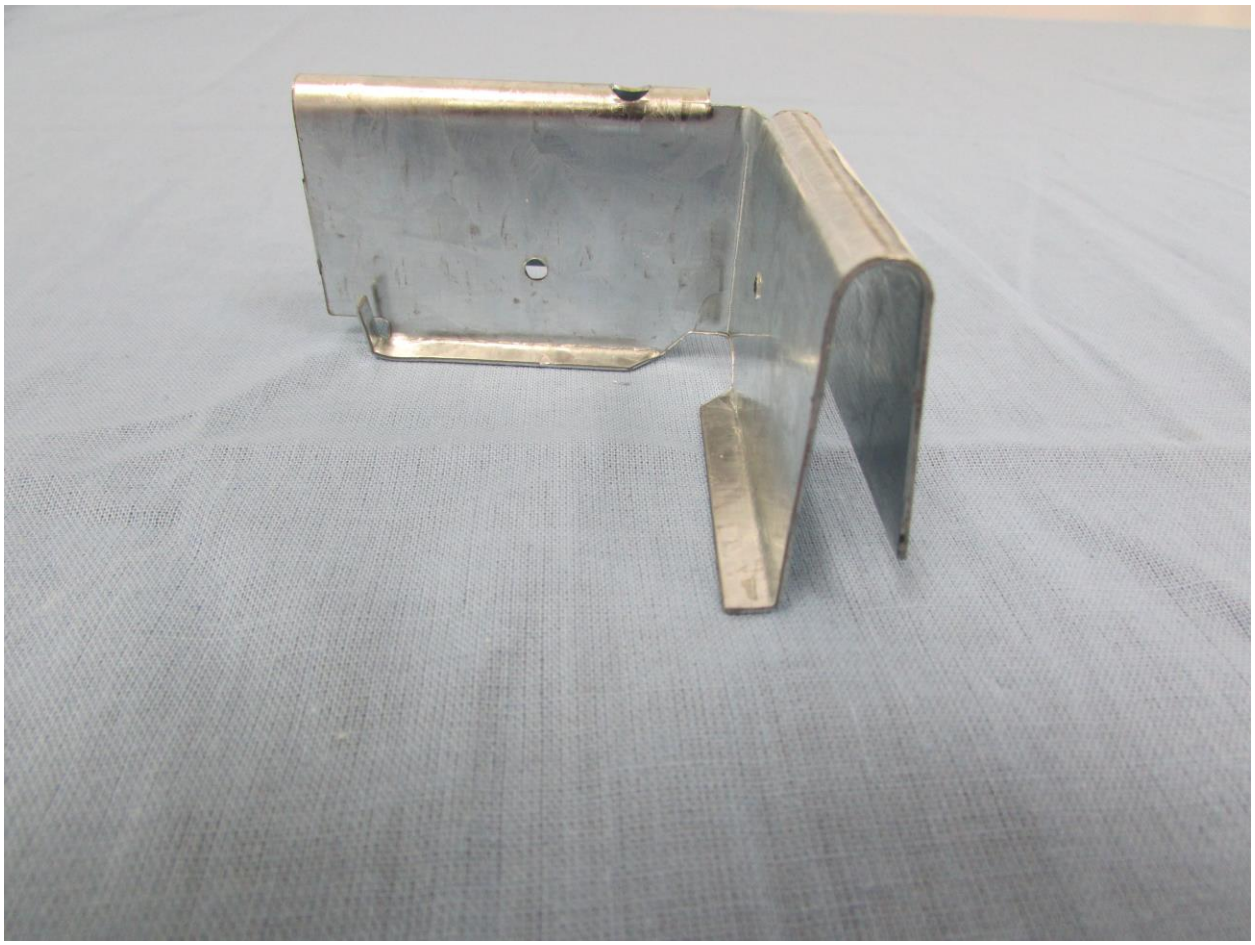
**Figure 3**

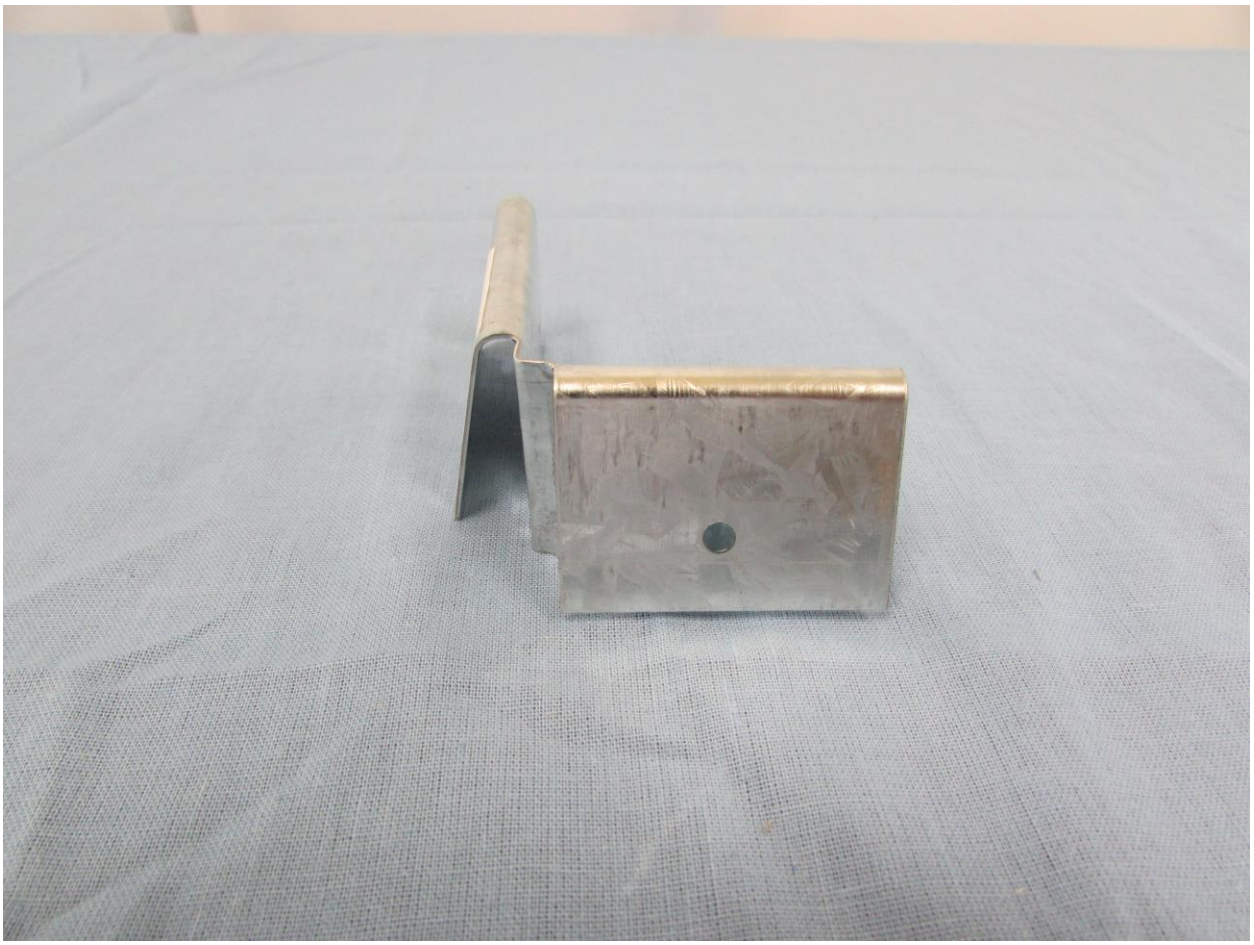
# PICTURES

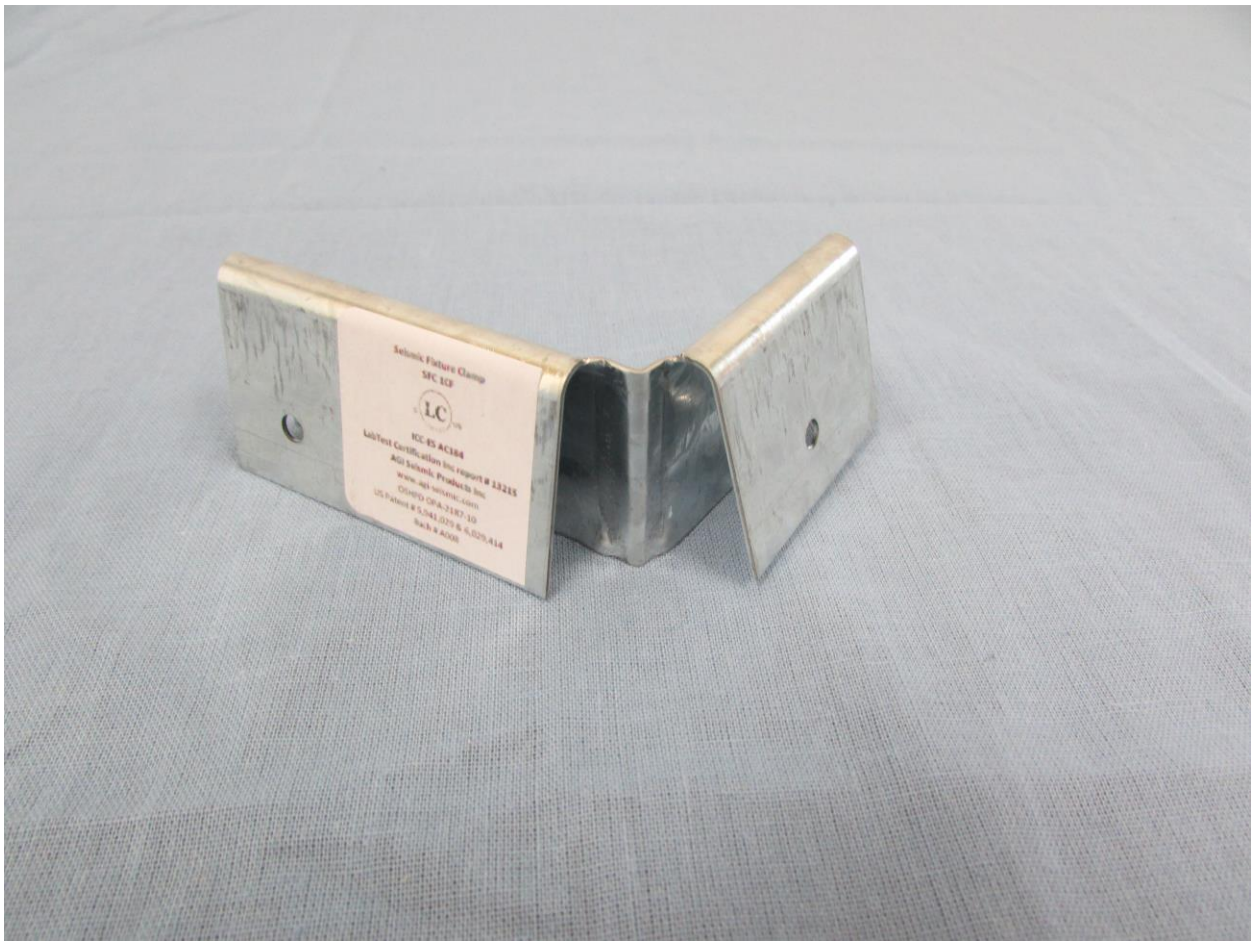


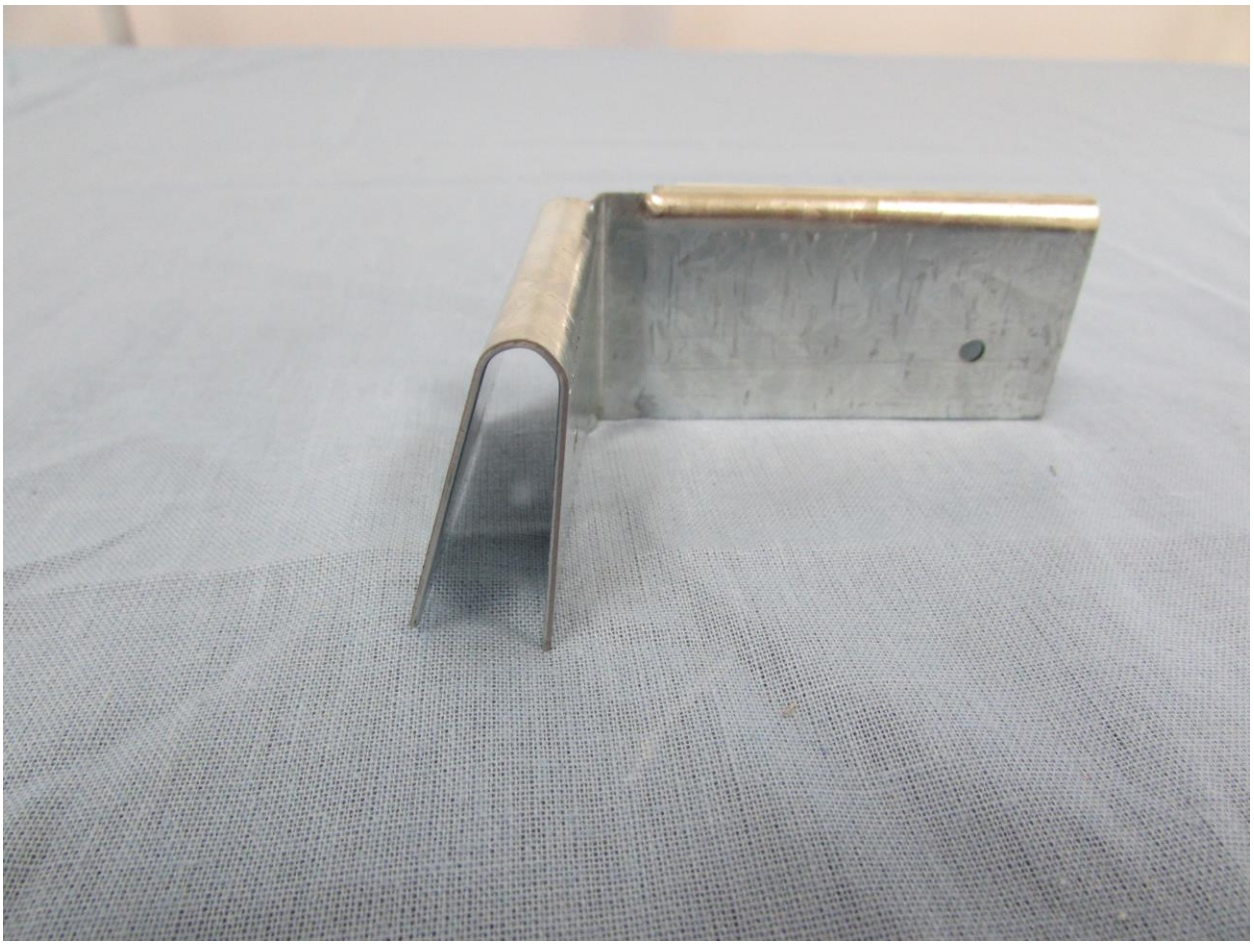


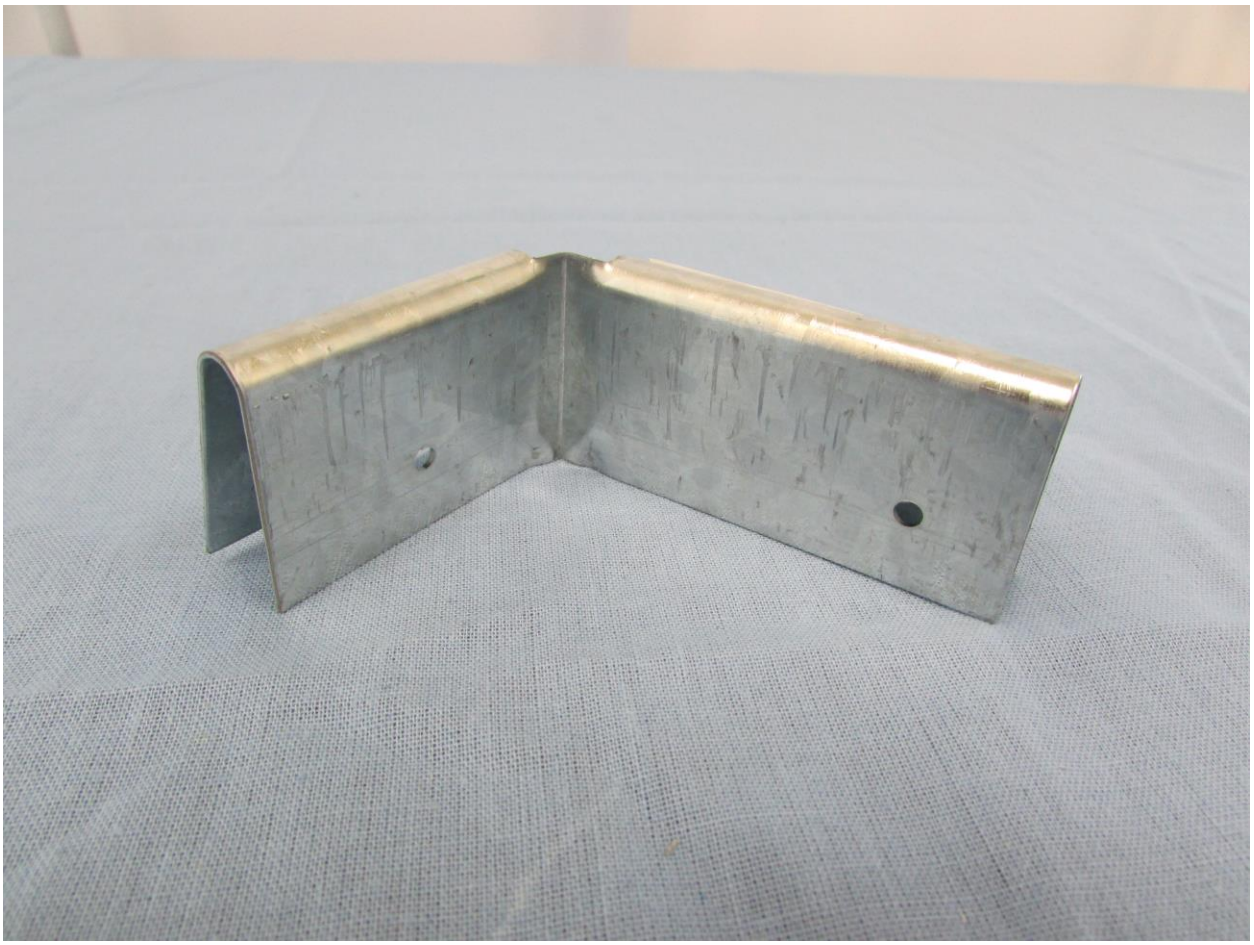


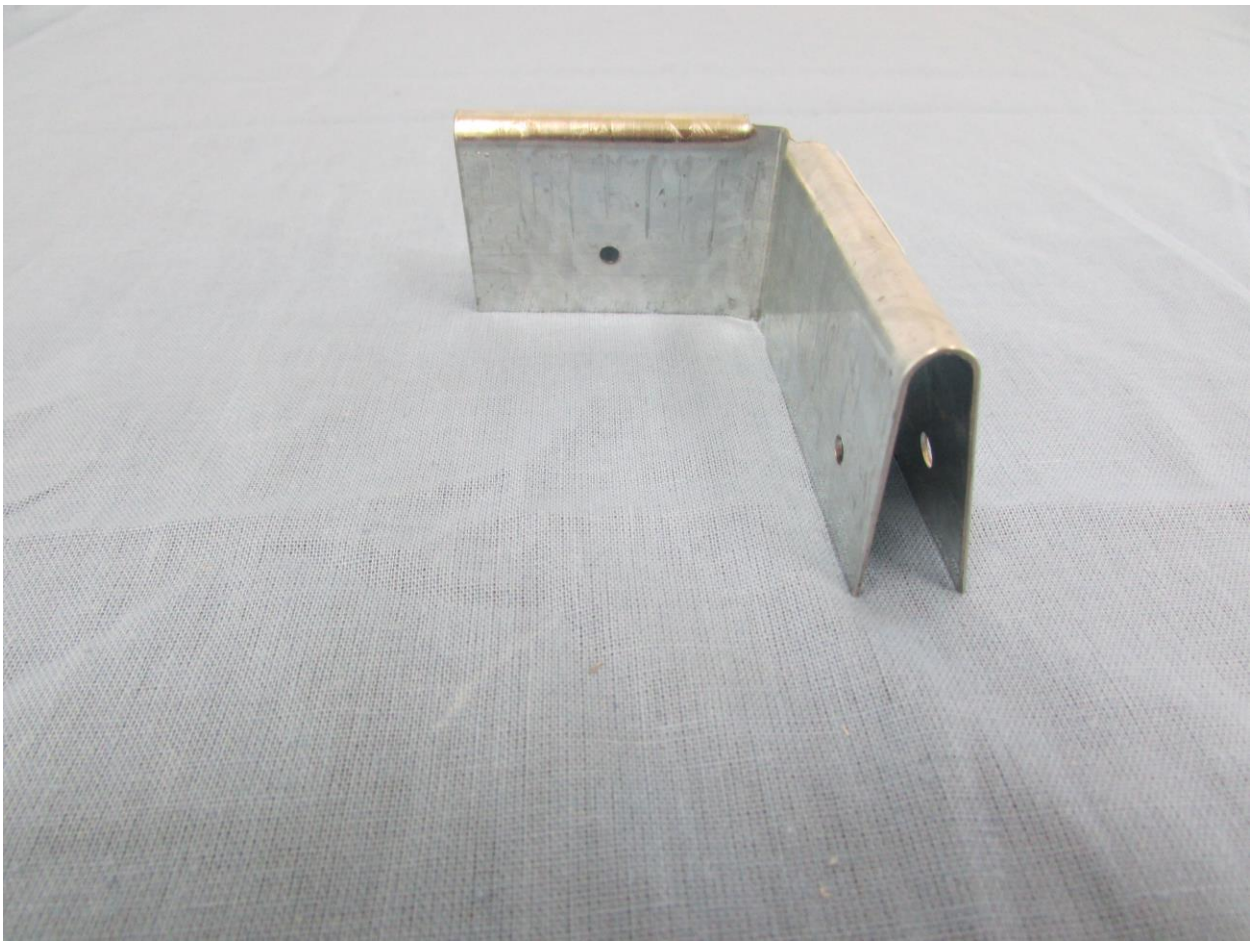


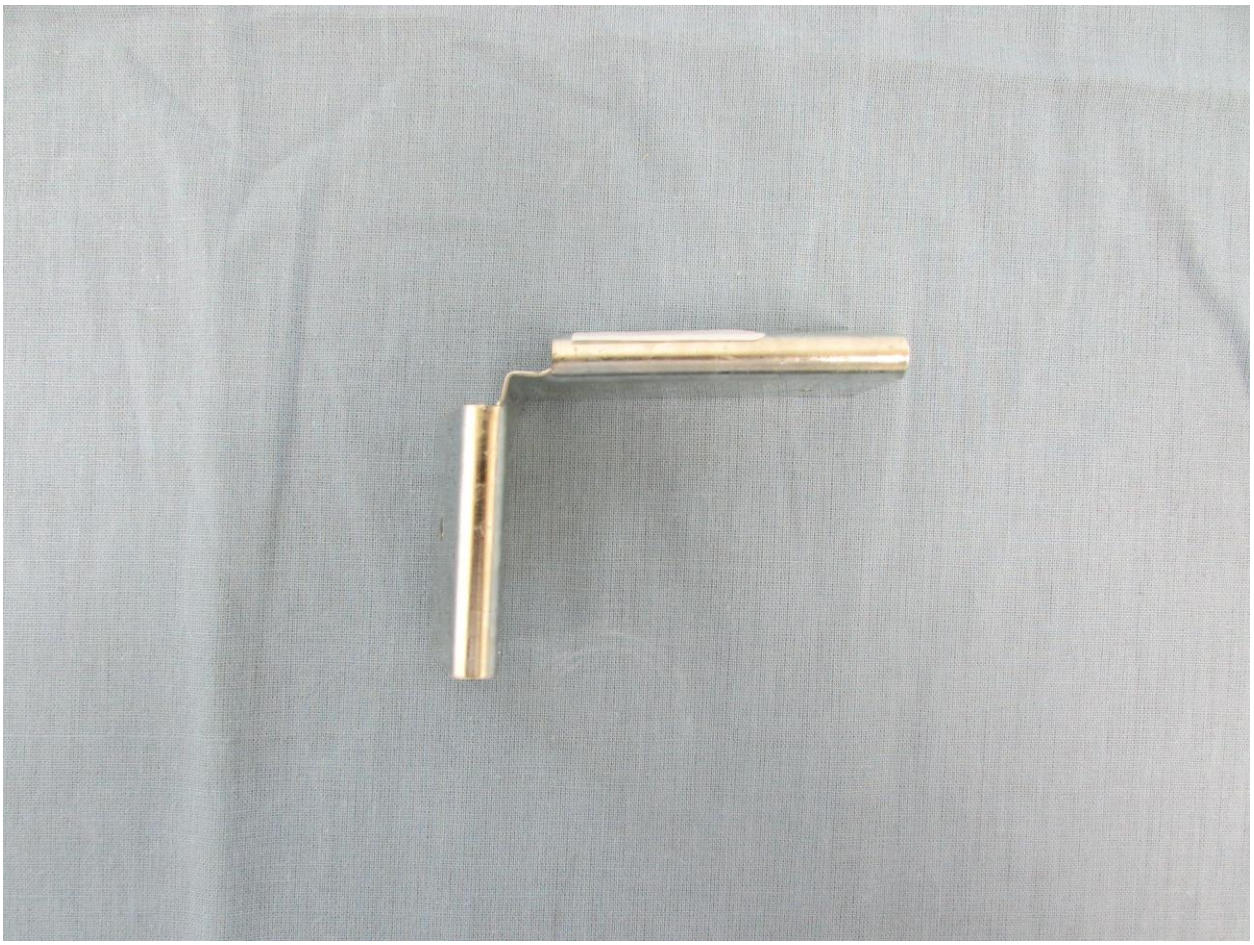


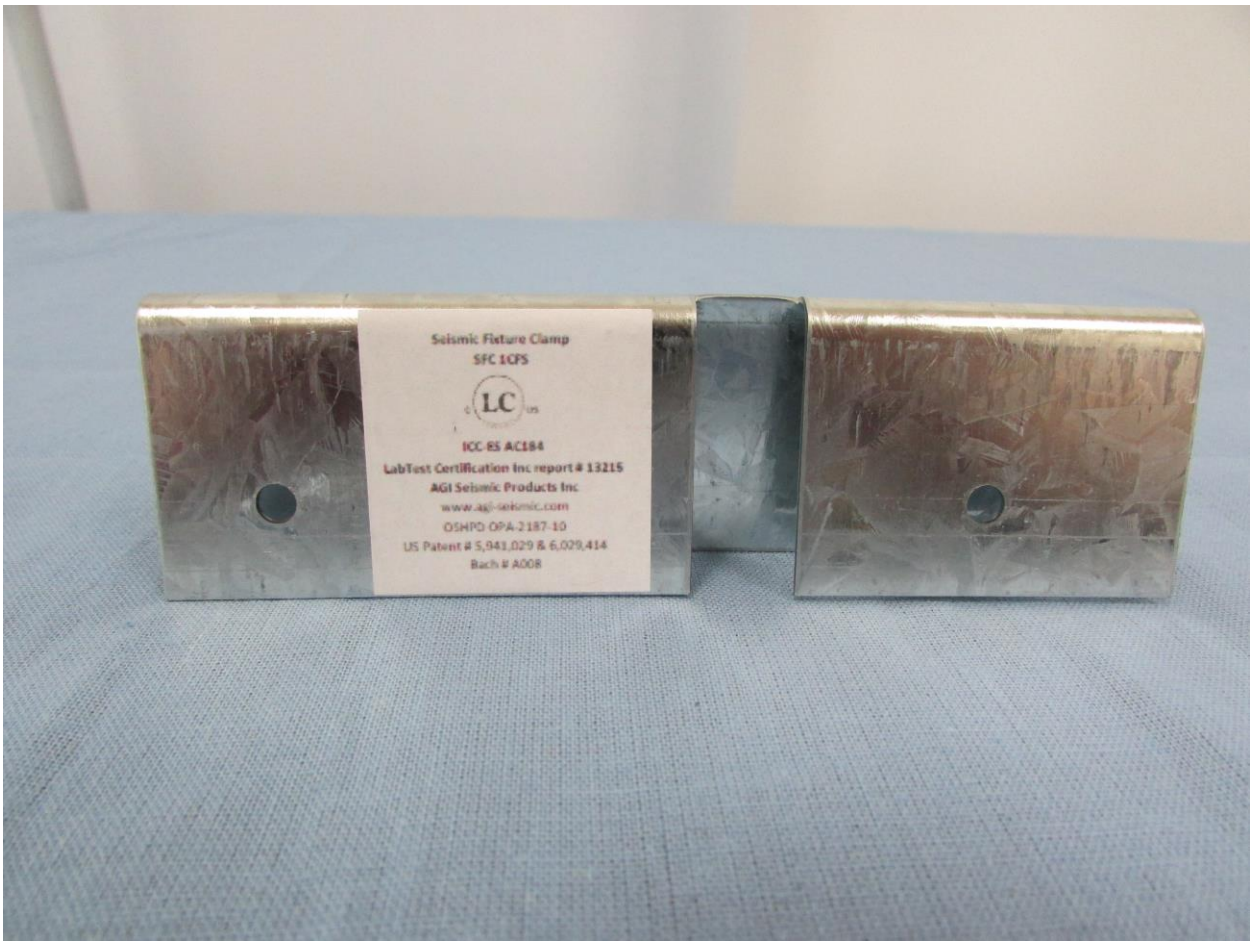


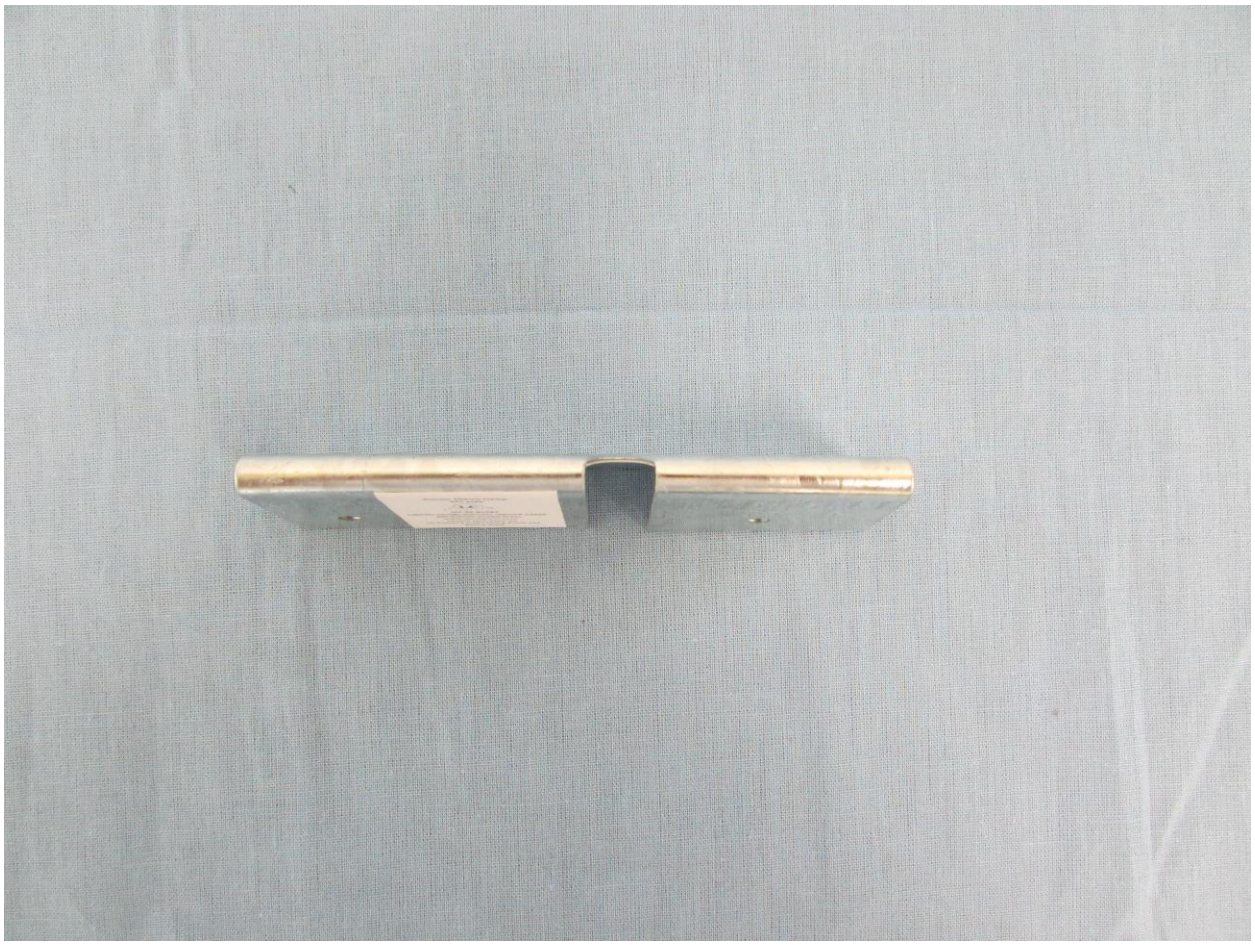


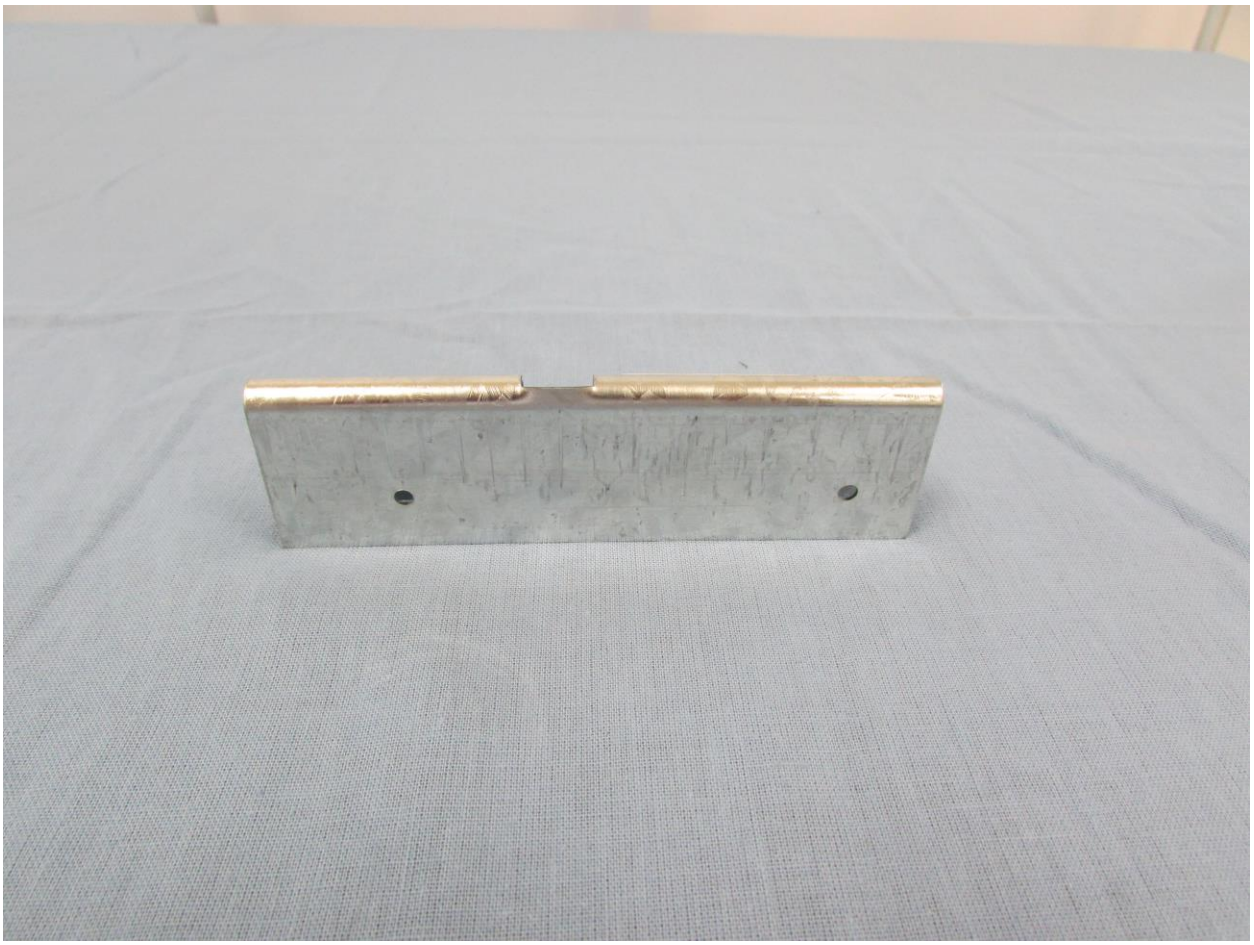


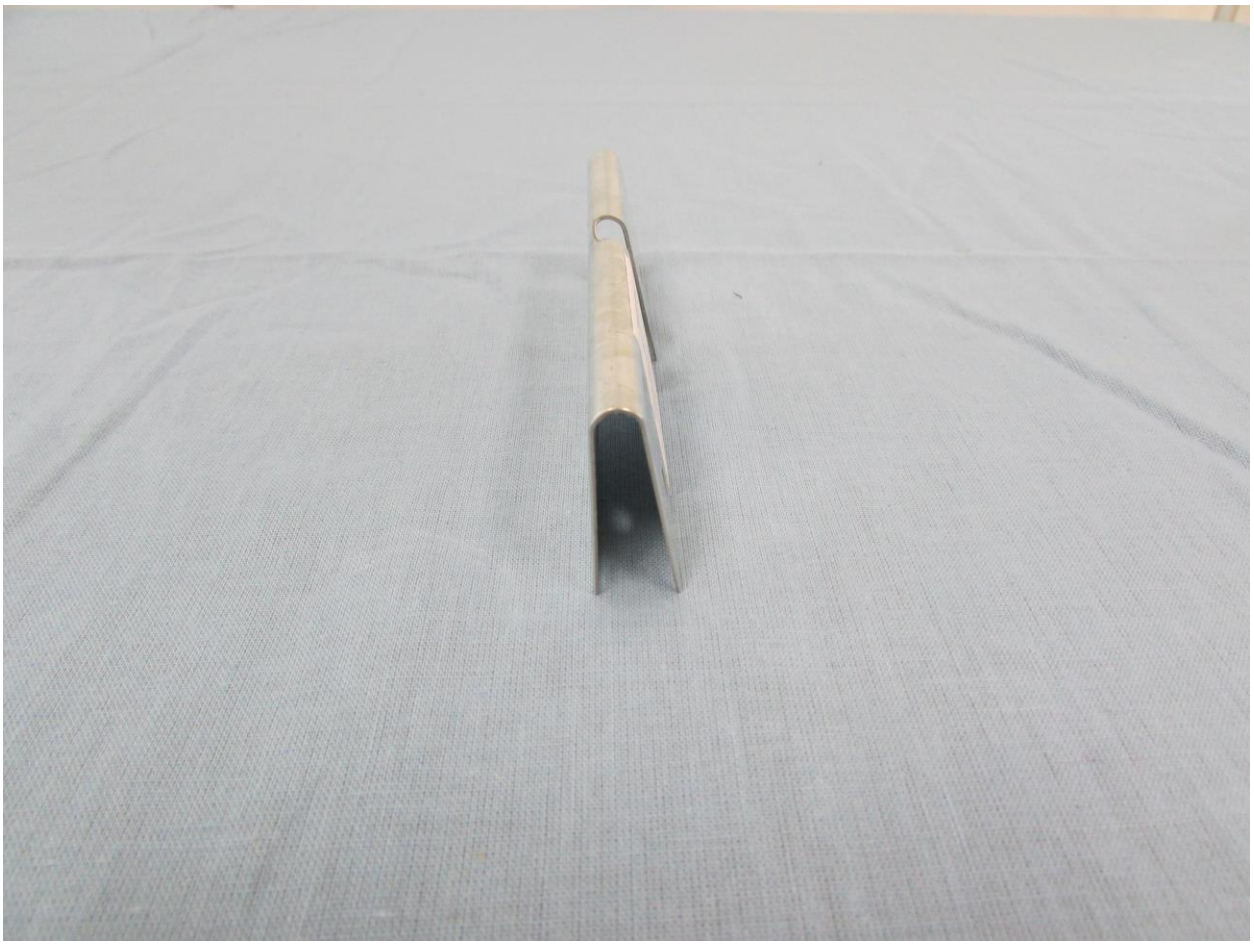


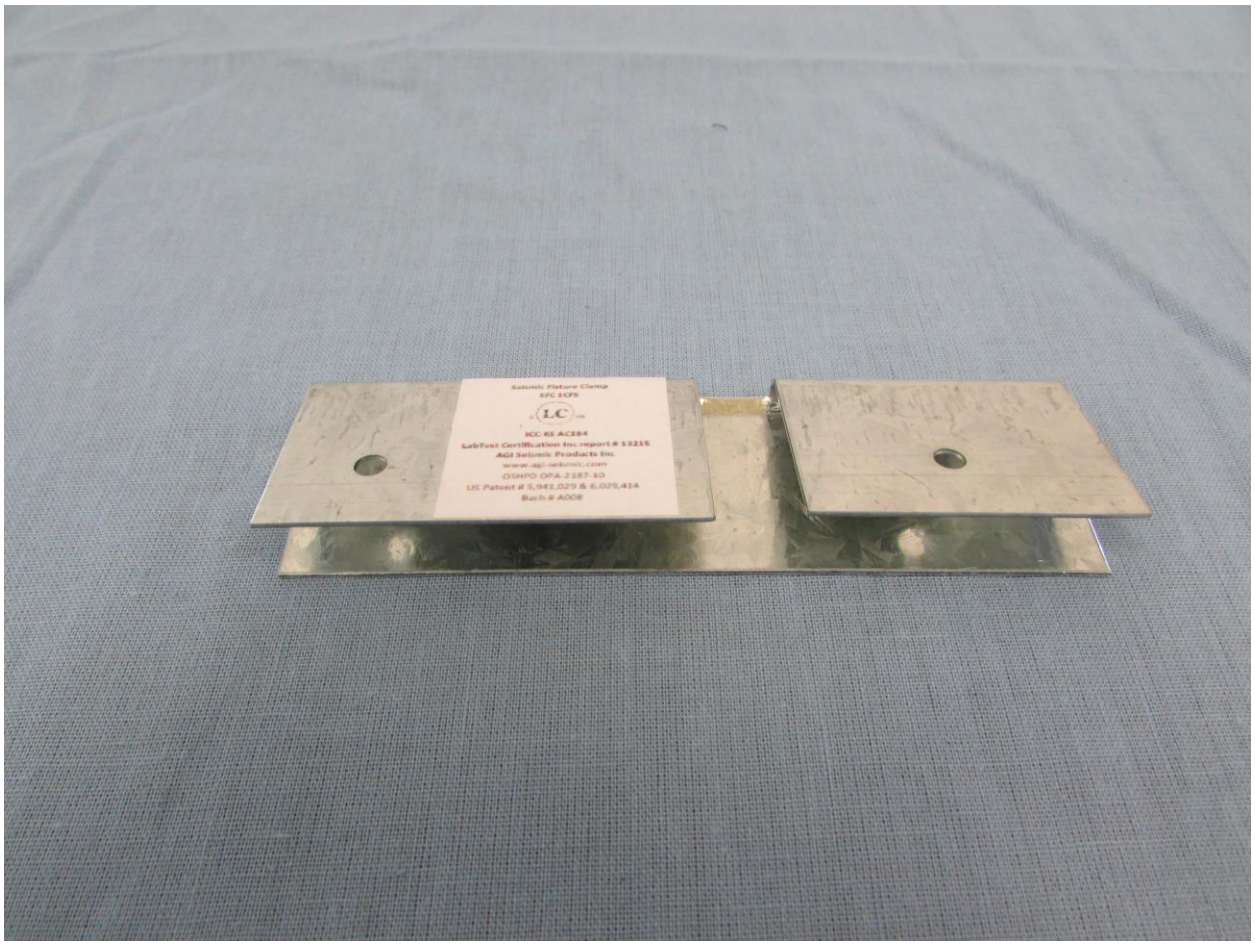


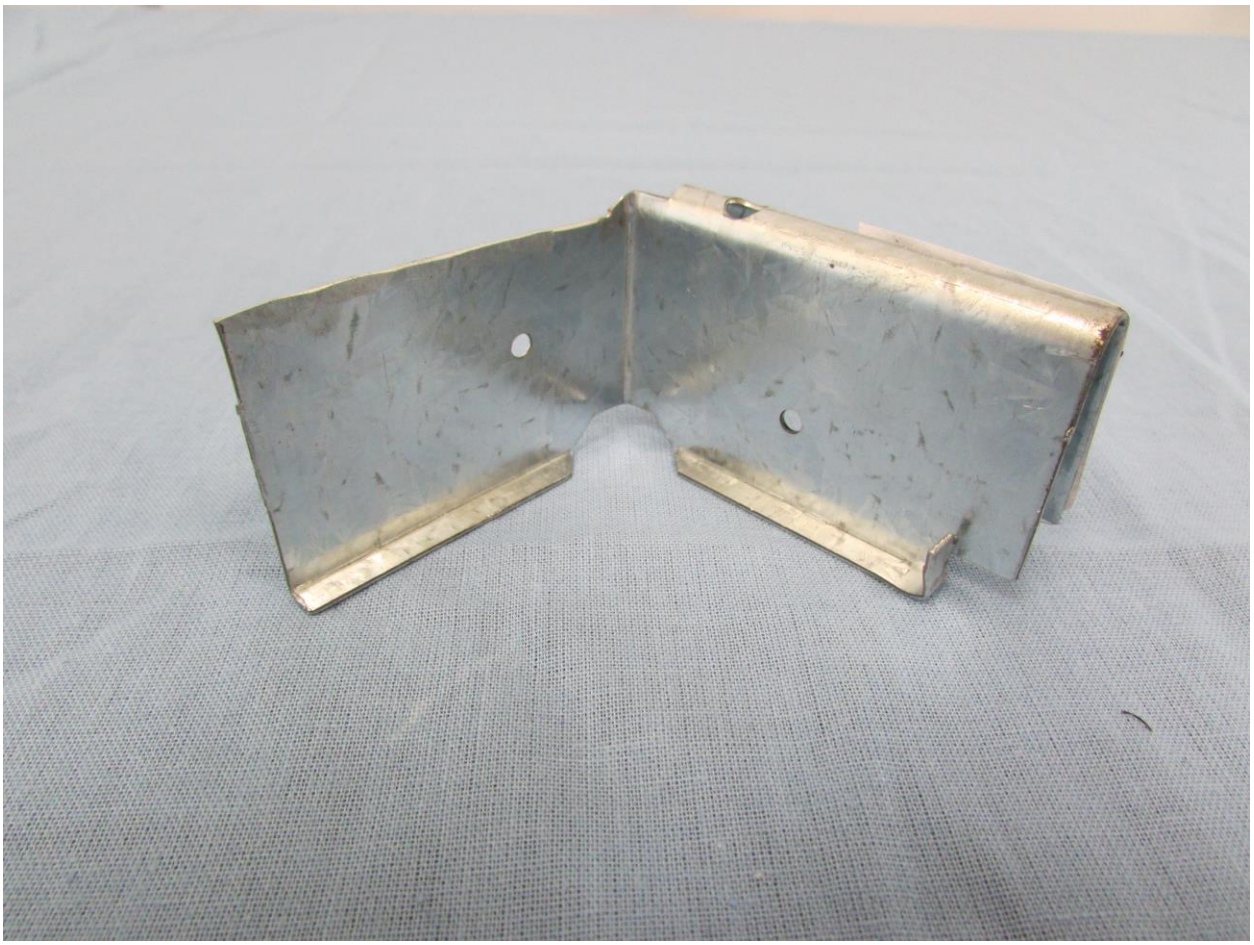


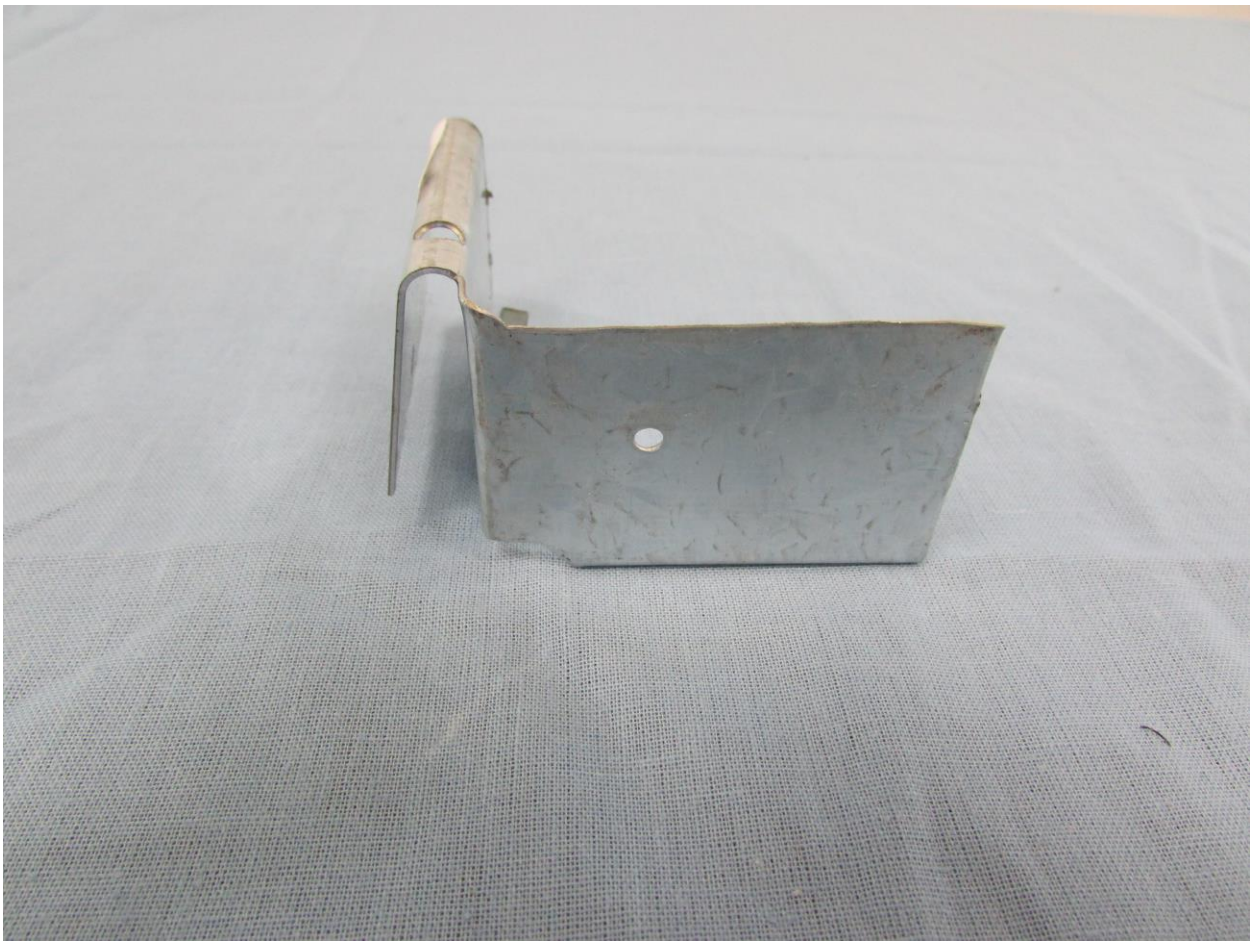


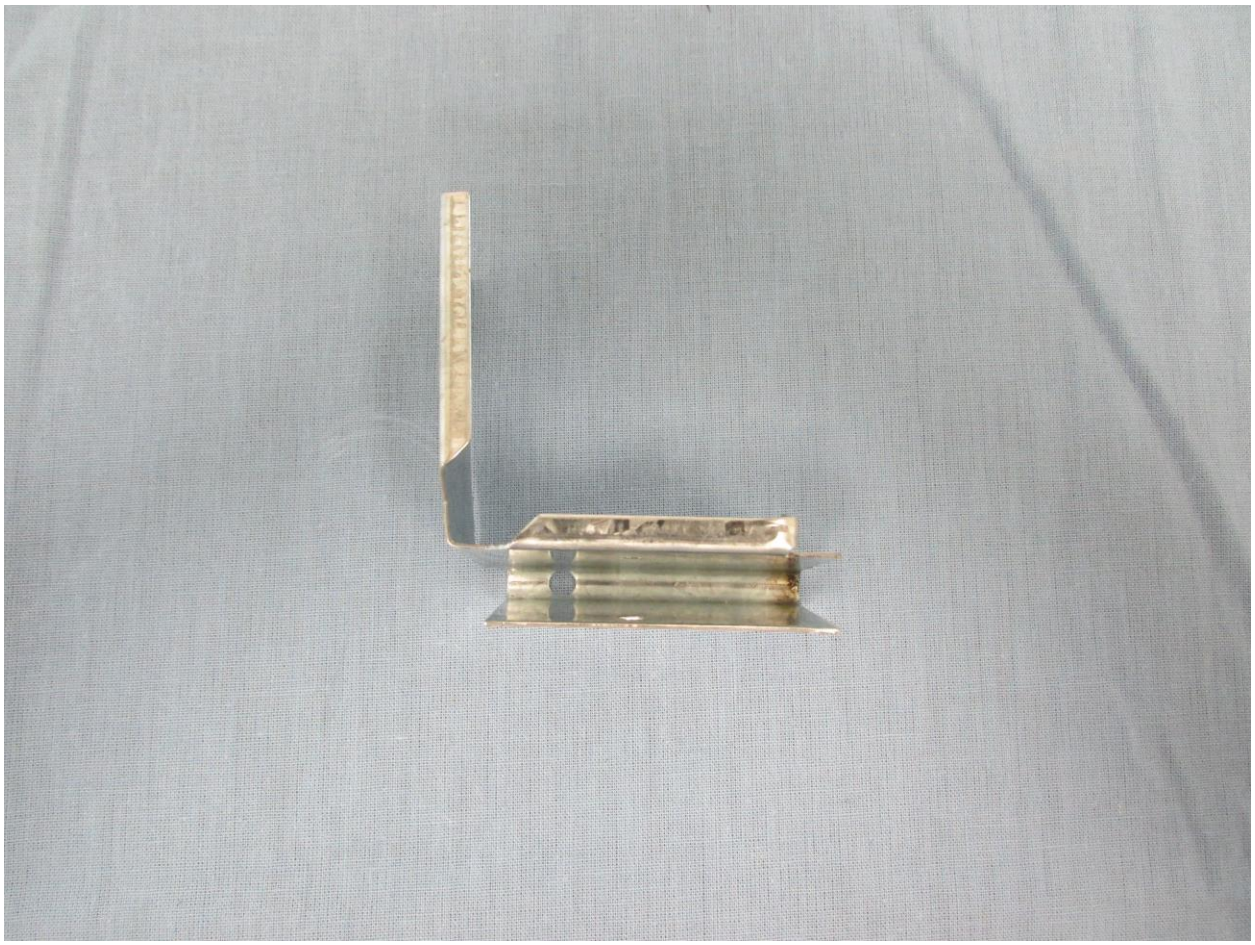


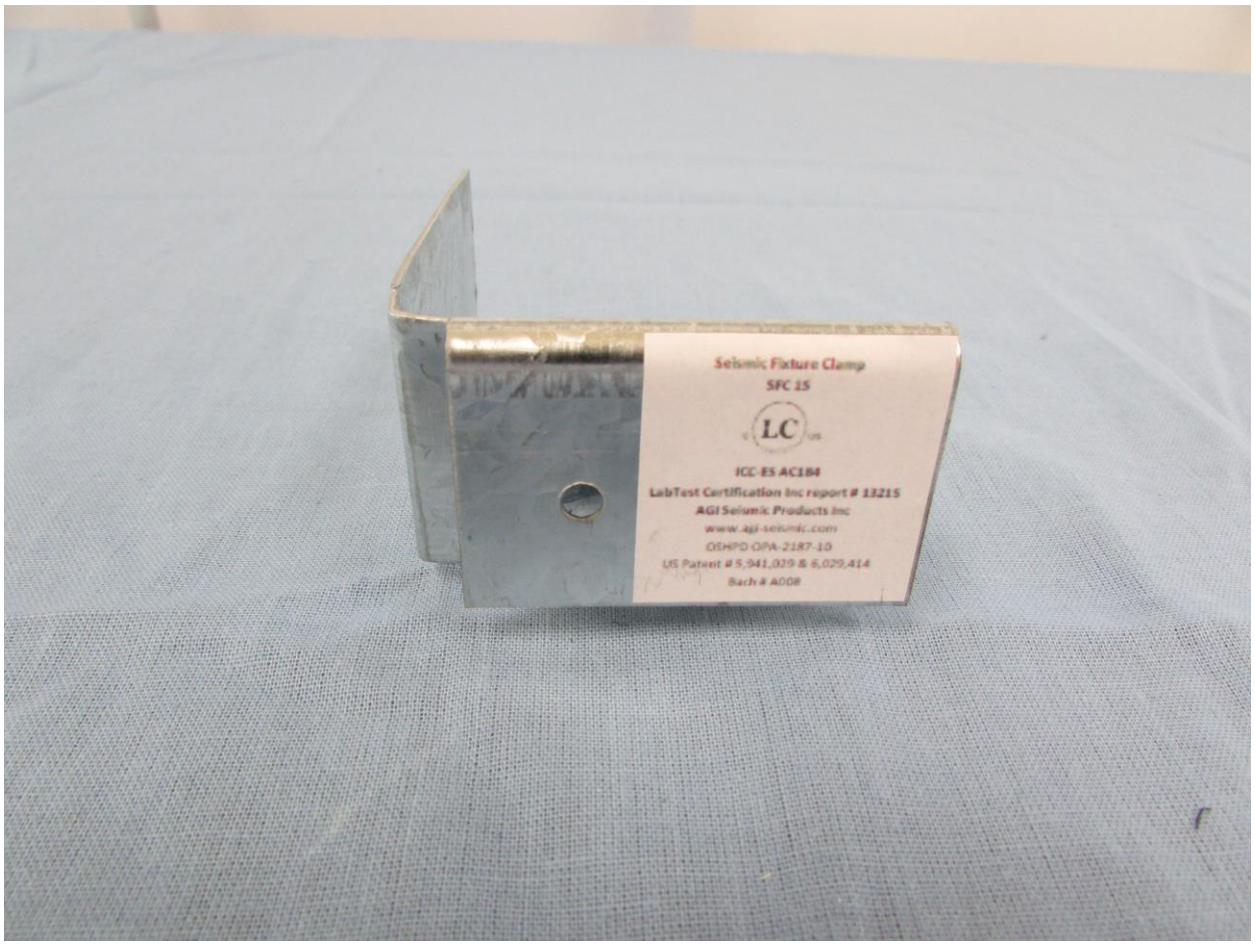


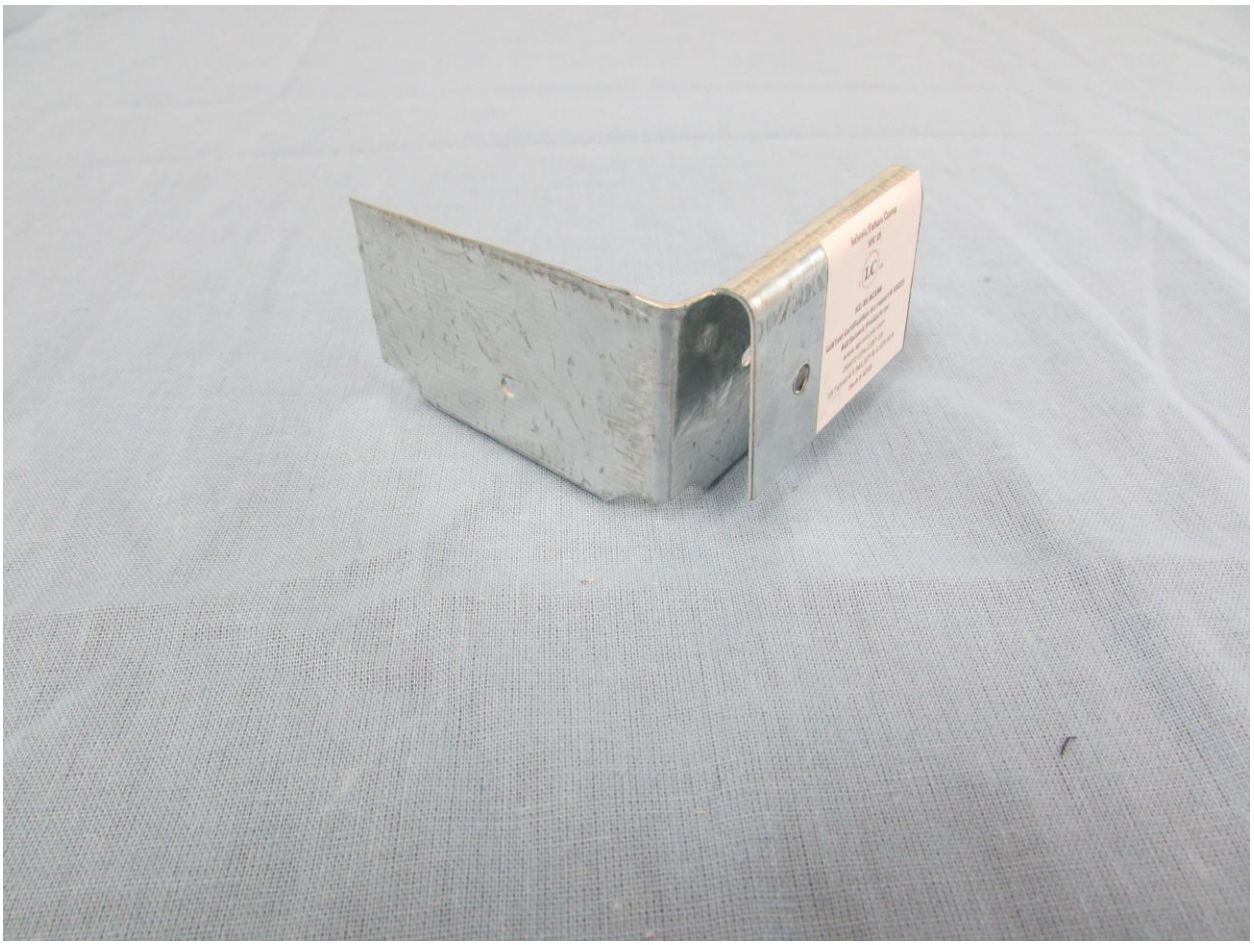


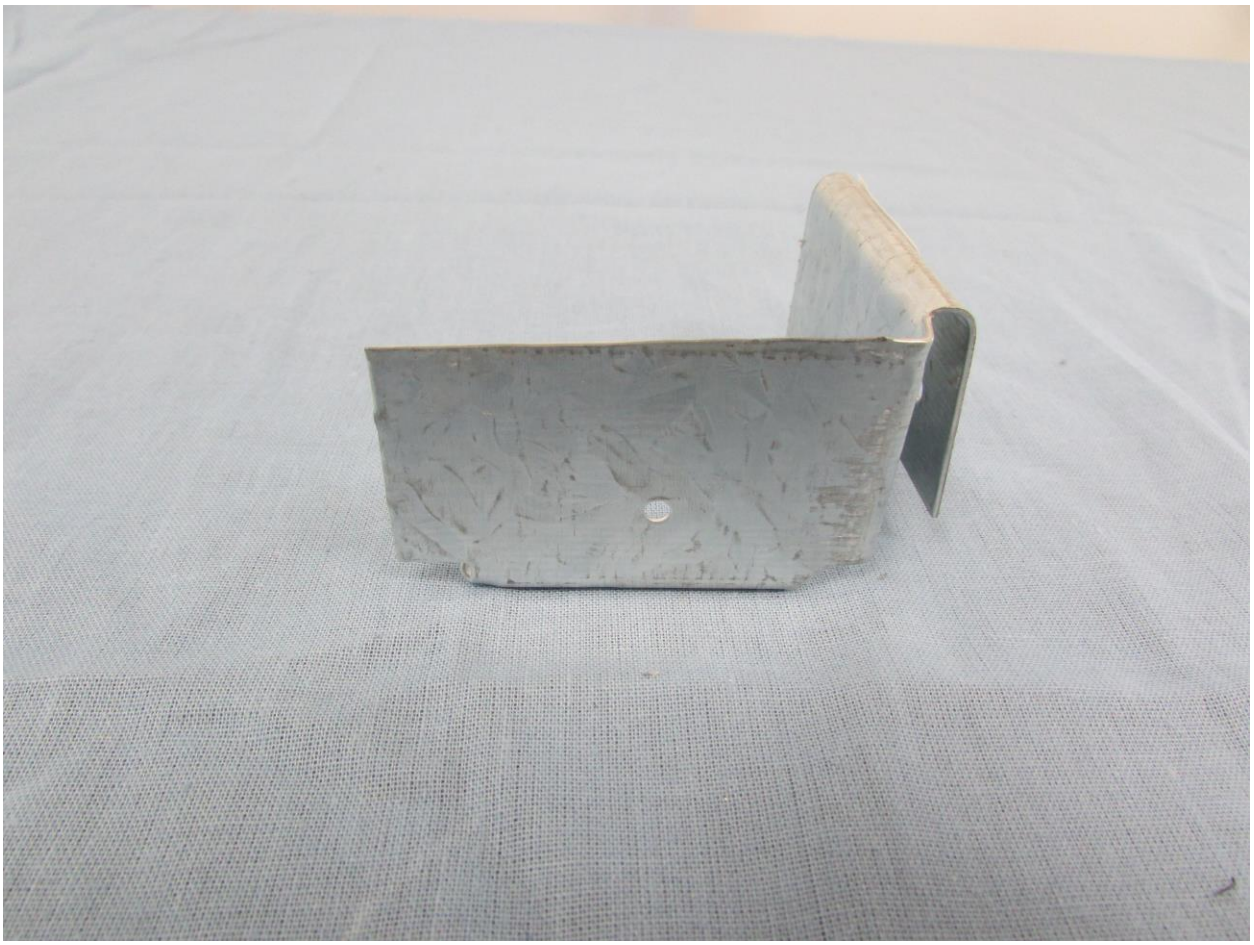


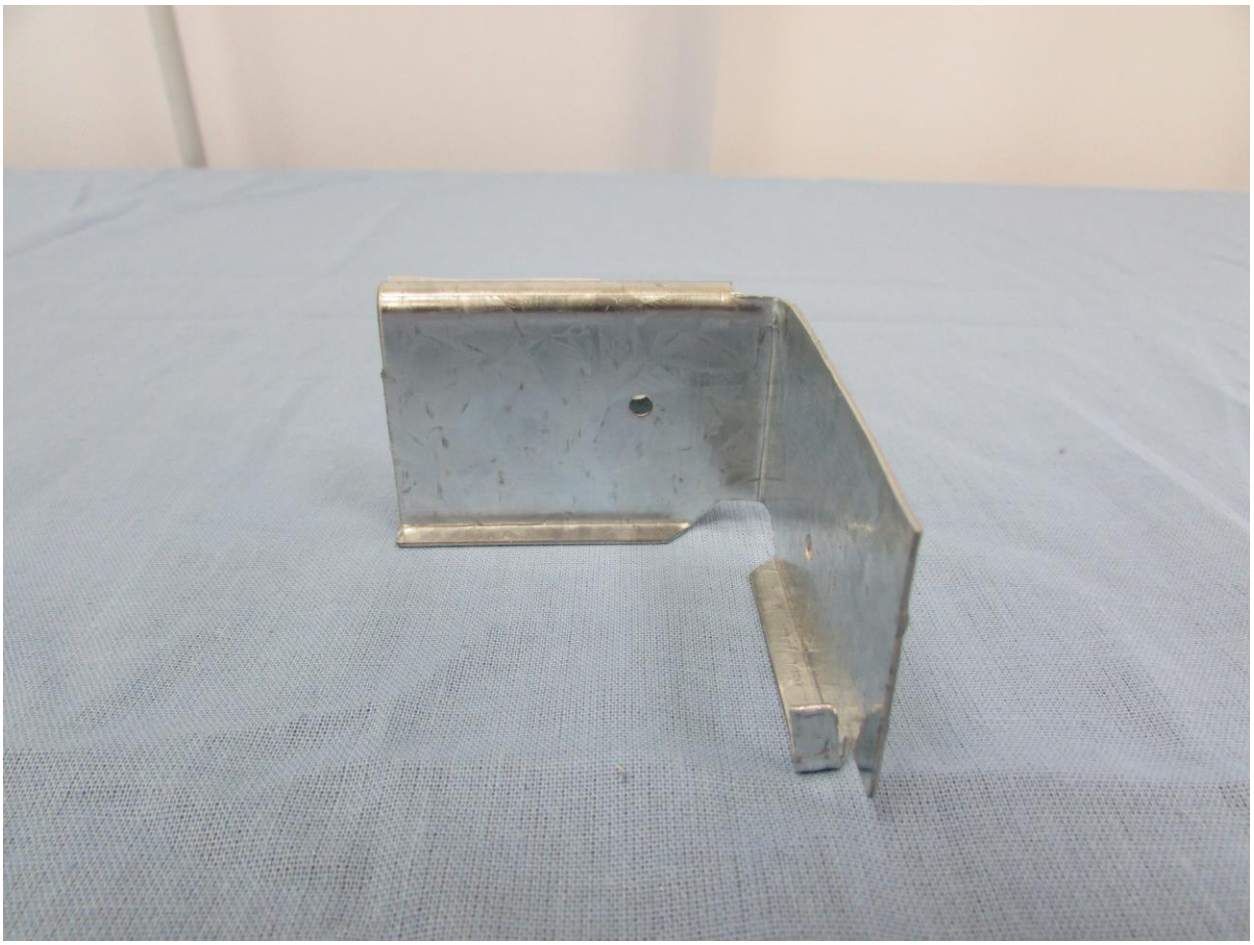


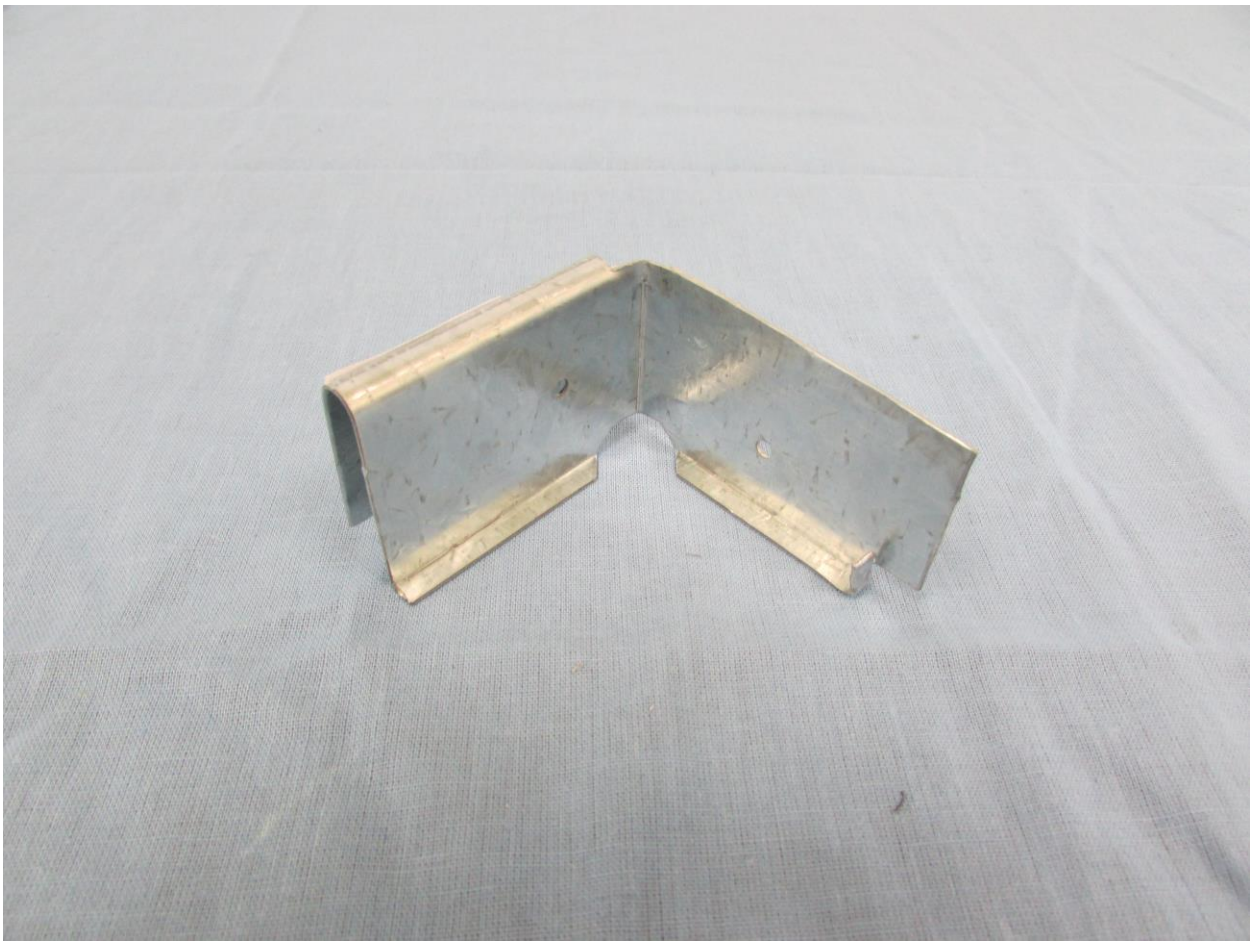


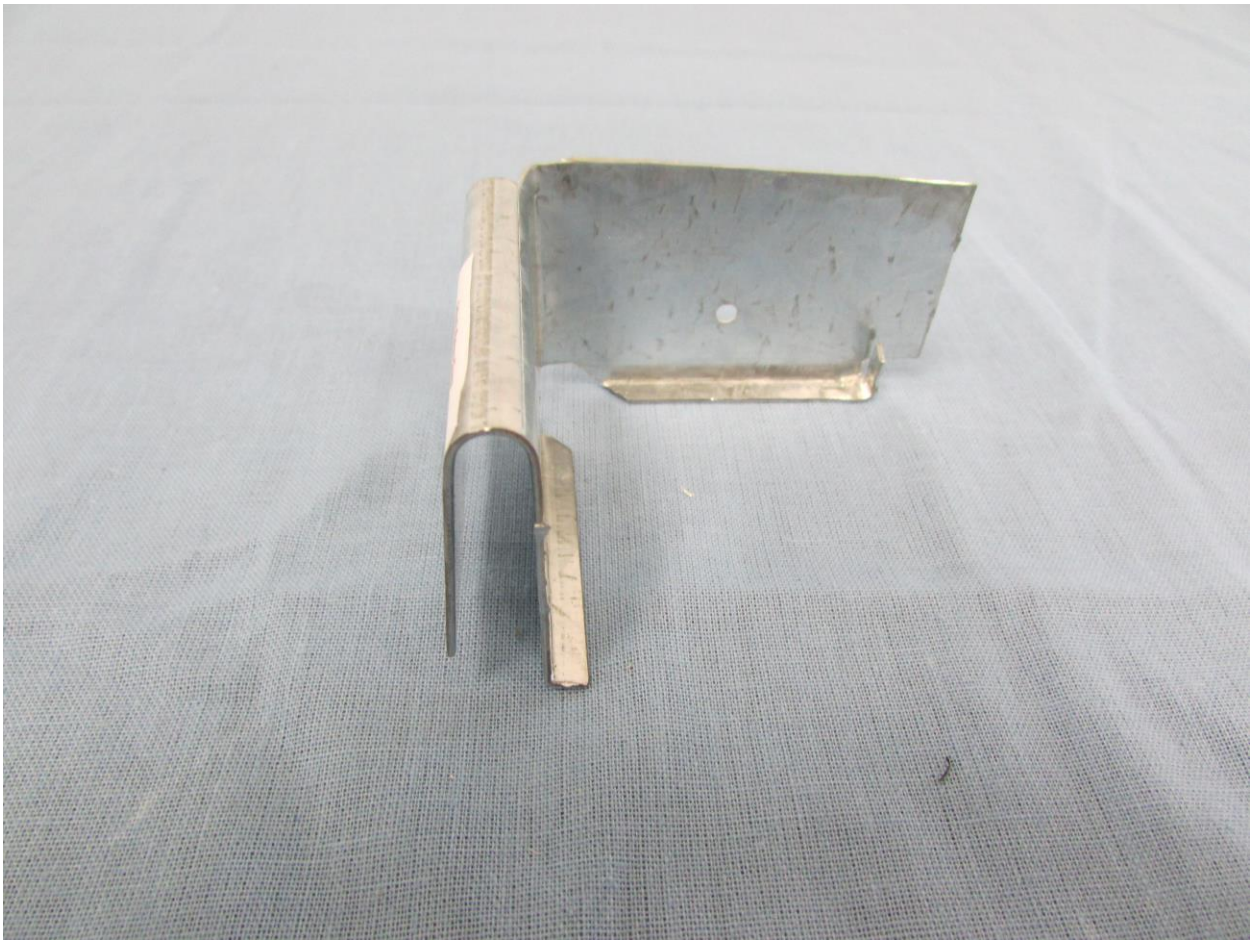


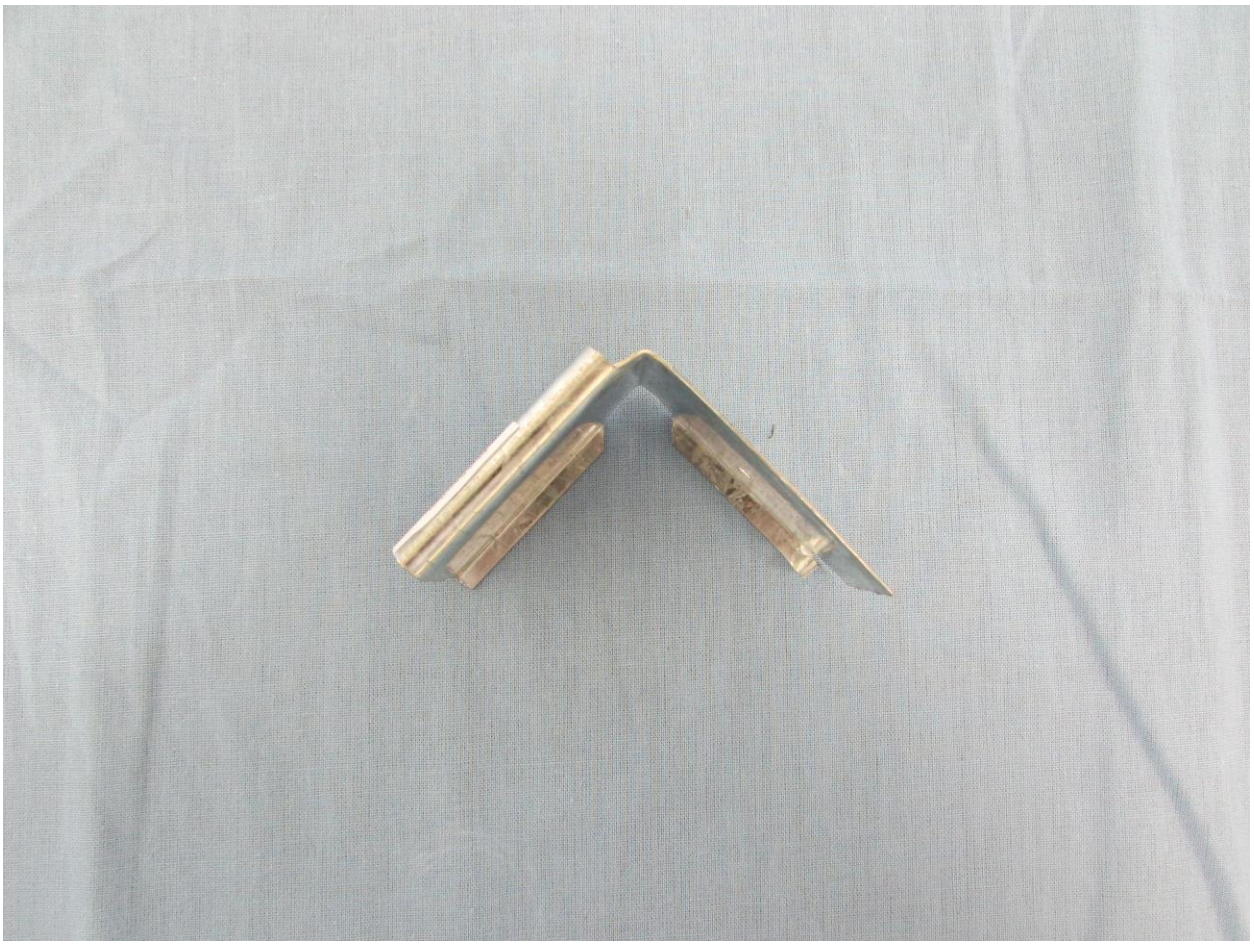


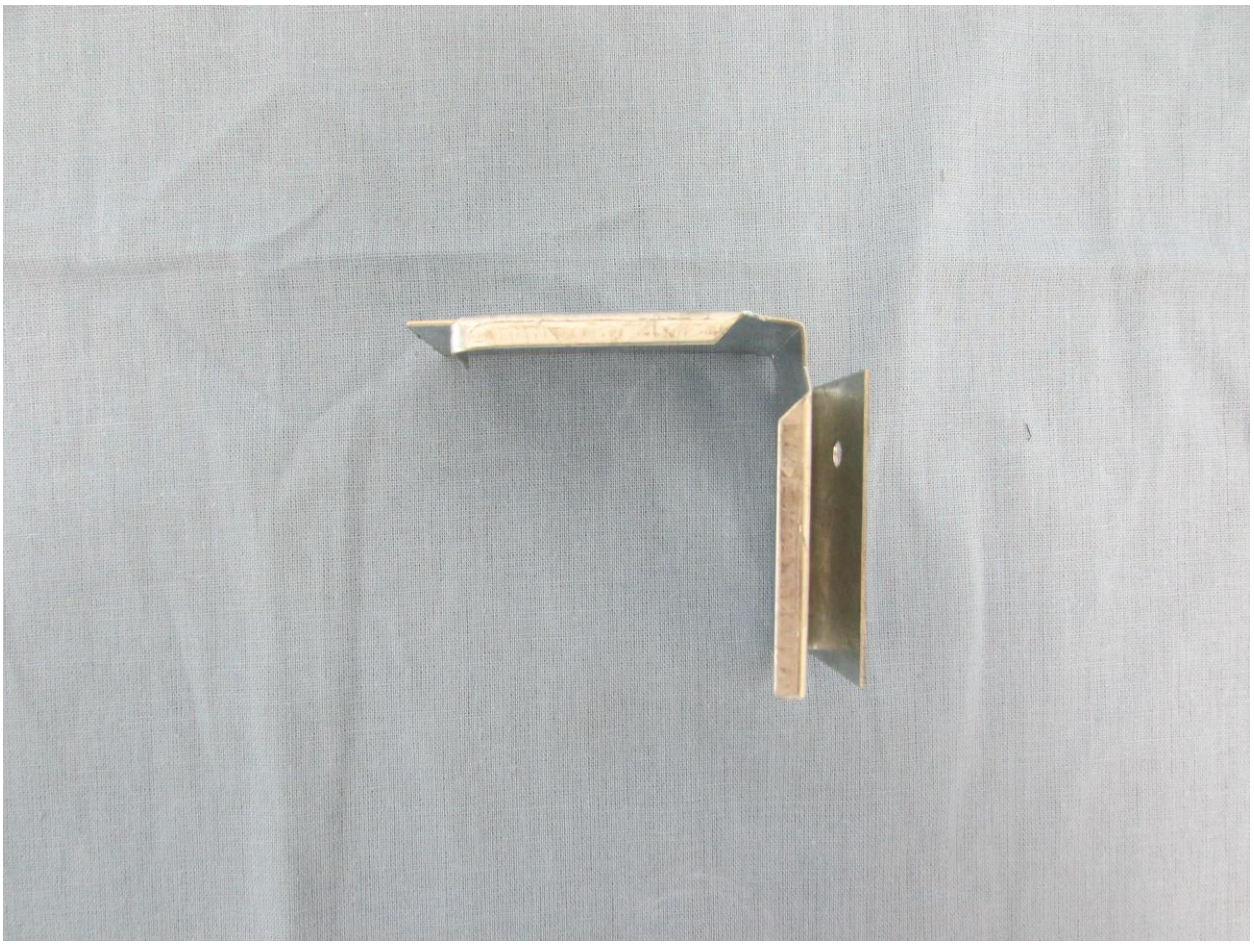


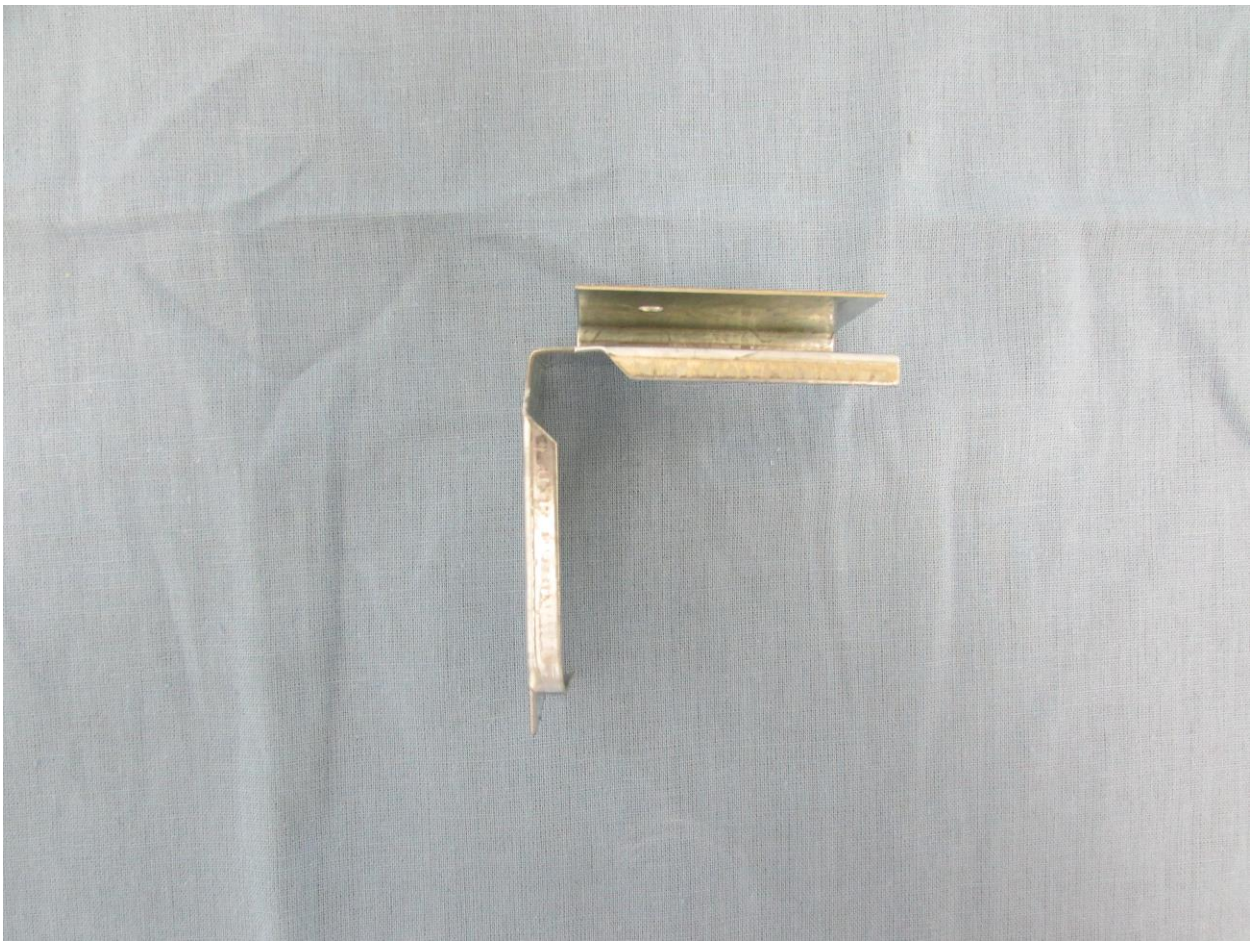












**Four Seismic Fixture Clamps attaching a tapered light fixture to main and cross runners as per Manufacturer's Instructions.**

# FACTORY PRODUCTION TESTS

**No Factory Tests Required**

| Date Issued: | Project No: | Client | Report No: | Revision No: |
|---|---|---|---|---|
| April 13, 2016 | 13215 | AGI Seismic Products Inc. | 13215-1S | 0 |

## UNLISTED COMPONENTS REQUIRING RE-EVALUATION-N/A

| Item | Photo no: | Component | Manufacturer | Part No | Rating | Location | Frequency of re-evaluation | Sample size |
|---|---|---|---|---|---|---|---|---|
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**END OF REPORT**