



June 29, 2010

Ms. Elyse G. Levy, S.E.
Senior Staff Engineer
ICC Evaluation Service, Inc.
Chicago Regional Office
4051 W. Flossmoor Rd.
Country Club Hills, IL 60478

RE: Evaluation Committee June 1, 2010 memo seeking comment on proposed AC230 criteria

Dear Ms. Levy,

Responses to Staff's numbered revisions to AC230 follow:

#8. a) OK

b) Pre-manufacture wire tensile are irrelevant to pin fastener connection performance and should be deleted as a requirement under AC230.

Connection strength (if we use ASTM C1513 criteria: tension & shear) for pins is produced from the amount of fastener surface area in contact with the CFSF and then the CFSF compressive force resulting from the pin's forced entry. Therefore, tensile of either the wire or the finished pin is irrelevant. The mere installation of the pin in CFSF will create its own "pass/fail" measure of pin performance. If the pin is inadequate it will not penetrate the CFSF and fail to meet what should be a manufacturer's installation requirement (in our case through the CFSF a minimum of 5/16"). Tensile measurements superfluous need to be deleted.

c) Use of ASTM B117 to evaluate the corrosion resistance of pin fasteners is consistent with the requirement for screw fasteners. However, the use of the term "damp environment" needs to be deleted because there is no quantifiable standard for "damp" in our codes. The call for additional corrosion testing under sections 3.1.3.1 and 3.1.3.2 should be limited to fasteners that will be subject to a continued exterior exposure. In addition, the call for increased corrosion resistance testing for exterior fastening that is under the ASTM G87 or FM Research Standard 4450 or 4470 is excessive. The requirement for increased corrosion resistance for exterior applications can be accomplished by adding a third level of performance to the ASTM B117 testing. (e.g) 150 hours with no red rust.

#11. d) ASTM D1761 is the test criteria suggested for the single fastener transverse & lateral load testing in AC230. This D1761 protocol sect. 7 'Sampling' recommends sample sizes of 5 for each test unless +/- 15% in results; then re-test with 10 samples. Further, the proposed acceptance criteria for screws AC118 sect. 4.0 based on ASTM C1513 protocol would require 3 samples per test and if +/- 15% results; then a re-test of 6 samples. The committee proposes a departure in AC230 single fastener test sample size of 15 samples with a +/-5% variance that forces re-testing. The goal here is CONSISTENCY and I suggest we keep ASTM D1761 sect. 7 sample requirement of 5 per test with +/-15% results calling for retesting of 10 samples. The

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AC230 test sample requirement in section 3.4.3 "Sample Size" should be revised to "5 sample specimens per test with +/- 15% result causing re-testing of 10 samples".

Comment to on issues not contained in the 18 proposals in your memo of June 1, 2010 follow:

- 1) Section 2.1.1.1 should have the phrase "or catalogue series" added after "...catalogue numbers...". The term "series" will provide greater accuracy when referring to the range of fastener dimensions a manufacturer gives in Section 2.1.1.2.
- 2) The requirement for a tool description(s) under Section 2.1.1.3 should be deleted. The method used for fastener placement is irrelevant as long as the installed fastener meets/exceeds connection penetration requirements as defined by manufacturers' recommended installation. The fastener must be penetrating through the CFSF.

Sincerely,

A handwritten signature in cursive script, appearing to read "Robert J. Shluzas".

Robert J. Shluzas, President
Aerosmith Fastening Systems



July 1, 2010

Elyse G. Levy, S.E.
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Subject: Public Comment on ICC-ES AC230

Dear Ms. Levy:

By means of this letter, and as follow-up to our phone conversation earlier today, Hilti, Inc. would like to submit official public comments on your letter dated June 1, 2010 regarding proposed revisions to ICC-ES Acceptance Criteria for Power-driven Pins for Shear Wall Assemblies with Cold-formed Steel Framing and Wood Structural Panels, AC230.

Below, comments are presented in response to the proposed changes in your letter in the order they appear in the letter. Some comments are editorial in nature and others are substantial.

1. Hilti, Inc. agrees with the removal of the 1997 UBC from AC230.
2. Hilti, Inc. has no specific comment on changes to Section 1.2 at this time.
3. Hilti, Inc. has no specific comment on changes to Section 1.3 at this time.
4. Hilti, Inc. has no specific comment on changes to Section 1.4 at this time.
5. Hilti, Inc. has no specific comment on changes to Section 1.5 at this time.
6. Hilti, Inc. has no specific comment on changes to Sections 2.1.2 and 2.1.3 at this time.
7. Hilti, Inc. has no specific comment on changes to Section 2.1.4 at this time.
8. a. Hilti, Inc. agrees with changes made to Section 3.1.1. However, the hardness testing should not state "replicate pins", but rather "pins from each lot used in the testing". This alternative language would be

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consistent with material identification test specimen requirements of other similar fasteners.

b. Hilti, Inc. agrees with the deletion of the existing Section 3.1.2.

c. Hilti, Inc. disagrees with the addition of the corrosion test requirements to AC230. Hilti appreciates that the pin fasteners recognized under AC230 are intended as alternatives to ASTM C 1513 screw fasteners, however, it is Hilti's position that ICC-ES should only evaluate the structural performance of the pin fasteners and then simply address service environment limitations in the ESR Conditions of Use, stipulating that the fasteners are intended for interior applications only. This would be similar to how other AC evaluations are handled with respect to corrosion resistance.

If ICC-ES wishes to ignore the fact that because these pin fasteners are used for interior applications where corrosion should not be a concern, at the very least, staff should still allow for the recognition of an alternative fastener that may not pass this requirement, but with a Condition of Use stating the fastener does not meet that requirement. A performance based approach by ICC-ES to corrosion resistance would still allow for recognition of systems based on structural performance while still addressing service environment limitations for evaluated product in the ESR Conditions of Use.

Furthermore, if ICC-ES decides to adopt the requirements of ASTM C 1513 (and thus ASTM F 1941), then the entire language of ASTM F 1941 should be adopted including the exceptions listed in Section 6.2. This Section allows for the presence of corrosion products at the edges of the fastener. This would not present a corrosion or structural performance concern and would be analogous with how the free edges of sheared and punched cold-formed steel members are allowed to be uncoated and unprotected.

9. Hilti, Inc. believes that the wood structural panels used in the qualification testing need only be representative in strength and thickness to the assemblies for which recognition is sought. For



example, structural plywood panels and OSB panels may be justified as equivalent wood structural panels for shear wall construction, as long as evidence demonstrating the equivalence is provided to ICC-ES.

10. a. Hilti, Inc. agrees with the addition of ASTM A 653.
- b. Hilti disagrees with the use of "minimum specified thickness" in Section 3.3.4 as being the basis from which adjustments are made. The language in the current version of AC118 should be acceptable as it states "specified (design) thickness".

Hilti, Inc. also disagrees with the statement found in Section 3.3.4, which states, "The worse case between R_s for the studs and R_s for the tracks shall be used to adjust shear wall capacities". Hilti believes that the adjustment factor, R_s , utilized in determining shear wall capacities should be determined by where the predominant failure location occurs (stud or track) as this location would be where the steel strength affected the shear wall capacity.

11. a. Hilti, Inc. agrees with the addition of the ability of the applicant to provide tension load data for single fastener connections. However, as these fasteners are intended as alternates to ASTM C 1513 screw fasteners, the test program that should be utilized is AISI S905 and not ASTM D 1761.

With the addition of the optional transverse load capacity determination, it is recommended that ICC-ES add a section or language with regard to combined loading. If transverse loading exists in combination with shear loading on single fastener connections, then the combined loading relationship should be defined in some way. For simplicity, Hilti would recommend using a similar approach to AC70 Section 3.3.4 .

- b. Hilti, Inc. agrees with the addition of the ability for the applicant to provide single fastener lateral load values.
- c. Hilti, Inc. has no specific comment on these changes at this time.
- d. Hilti, Inc. has no specific comment on these changes at this time.



12. Hilti, Inc. has no specific comment on changes to Section 3.7 at this time.
13. Hilti, Inc. has no specific comment on changes to Section 3.7 at this time.
14. Hilti, Inc. has no specific comment on deletion of Section 4.2.2 at this time.
15. Hilti, Inc. has no specific comment on changes to Section 4.3 at this time.
16. Hilti, Inc. has no specific comment on changes to Section 4.4 at this time.
17. Hilti, Inc. has no specific comment on changes to Section 6.0 at this time.
18. a-c. Hilti, Inc. has no specific comment on these changes at this time.
 - d. Hilti, Inc. disagrees with the use of the language "unadjusted ASD design capacity" in A2(a). The applicant should be allowed to adjust allowable loads as necessary to satisfy the requirements of Appendix A.

Also, if the language is to be used, it would make more sense to include it in the definitions in A1. Definitions.

We look forward to working with ICC-ES in order to create a reasonable and useful acceptance criteria for the evaluation of shear wall assemblies. We welcome an opportunity to continue our dialogue on ICC-ES AC230. Please contact me by phone at (918) 872-5805 or by e-mail at drew.liechti@hilti.com.

Thank you for your consideration.

Regards,

A handwritten signature in black ink, appearing to read "Andrew T. Liechti". The signature is stylized and cursive.

Andrew T. Liechti, P.E.
Technical Services Engineer

cc: William Gould, P.E.
Michael Beaton, P.E.

From: rleichti@stanleyworks.com
To: [Rosalind Fazel](#)
Subject: AC230 Comments
Date: Thursday, July 01, 2010 3:45:11 PM

Comments on Criteria AC230.

Robert Leichti
StanleyBlack&Decker
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Comments:

After reviewing the proposed revisions, I am in general agreement with the points as outlined in the Staff letter of June 1, 2010. Given that AISI S213 provides for different engineering calculations for Type I and Type II shear walls, the identification of the Type for the evaluation report is appropriate. In addition, I offer comments to several sections of the revision text: Sections 1.1 and 1.2 both reference "site built" shear walls. This is an unnecessary limitation in that the same construction and fastening could be used in a prefabricated (modular) shear wall unit. The wording "site-built or modular" would relieve potential limitation of intent. Section 3.1.1 requires hardness tests of the pins to be used in testing, which cannot be done and then re-use the pins for testing. The section should require ... "core hardness of power-driven pins representative of those to be used in the shear wall testing" ... Section 3.3.3 requires that all of the framing members shall be tested. The evaluation committee heard an argument about this same issue during debate of AC259, and the committee decided that testing of "representative" framing members was appropriate and that it was not necessary to test every piece of framing.



June 10, 2010

Elyse G. Levy, S.E.
Senior Staff Engineer
ICC Evaluation Service
5360 Workman Mill Road
Whittier, CA 90601

RE: Proposed Revisions to the Acceptance Criteria for Power-driven Pins for Shear Wall Assemblies with Cold-formed Steel Framing and Wood Structural Panels, Subject AC230-0610-R1

Dear Ms. Levy,

Thank you for the opportunity to review the proposed changes to AC 230. We have the following comments for your consideration:

1. The first sentence of Section 3.8.1 should be modified to account for the fact that the adjustment factors for wind and seismic differ. The current text non-conservatively pairs the deflection-based ASD design strength for wind design from 3.7.3 with the 2.5 load factor for seismic design from 3.7.3. This can lead to an overestimation of the nominal strength for wind since a single nominal strength will be developed to cover both conditions. We believe the first sentence of 3.8.1 should be revised to read:

*“**Drift:** The nominal shear strength shall be determined as the lower of 2.5 times the allowable shear strength defined in Section 3.7.1 or 2.0 times the allowable shear strength defined in Section 3.7.2.”*

2. The deflection equation verification outlined in 4.4.3 should be made at the LRFD load level that will ultimately be used by the designer. For these systems, that load is defined by Section 3.8 and not by the F_s load in 3.7.1. There should also probably be a clarification that the check needs to be done each for each configuration tested. We suggest replacing the proposed last sentence of Section 4.4.3 with:

“This verification shall be undertaken for each shearwall configuration tested. To do this, the deformation calculation procedure shall be used to predict the drift at the V_{LRFD} load level developed in Section 3.8. The calculated deformation shall then be compared against the average measured deformation at that load level on the corresponding envelope curves from the cyclic test program. “

Thank you for consideration of these comments. If you have any questions regarding these comments please don't hesitate to contact me at 208-429-3715 or at Daniel.Cheney2@Weyerhaeuser.com

Sincerely,

Daniel W. Cheney (sent via e-mail)

Daniel W. Cheney, P.E.
Manager of Product Acceptance