

STATE OF CALIFORNIA
STATE AND CONSUMER SERVICES AGENCY
CALIFORNIA BUILDING STANDARDS COMMISSION
2525 NATOMAS PARK DR., SUITE 130
SACRAMENTO, CA 95833
(916) 263-0916 Phone
(916) 263-0959 Fax
Email: cbsc@dgs.ca.gov

Office Use Item No. _____

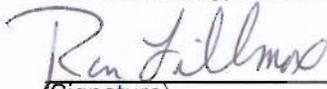
PARTICIPATION COMMENTS FOR THE NOTICE DATED AUGUST 31, 2012
Written comments are to be sent to the above address.

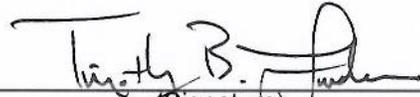
WRITTEN COMMENT DEADLINE: OCTOBER 15, 2012

Date: October 8th, 2012

From:

Ron Fillmore--Vice President, High Performance Building; and Timothy Lueder--Global Science and Technology Director


(Signature)


(Signature)

-- Dow Corning Corporation

Agency, jurisdiction, chapter, company, association, individual, etc.

2200 W. Salzburg Road Midland MI 48686
Street City State Zip

I/We (do)(do not) agree with:

[] The Agency proposed modifications As Submitted on Section No. 2410.1.2

and request that this section or reference provision be recommended:

[] Approved [] Disapproved [] Held for Further Study [] Approved as Amended

Suggested Revisions to the Text of the Regulations:

a. *The seismic drift limits ~~capability~~ of structural sealant glazing shall be determined by tests in accordance with AAMA 501.4, 501.6 ~~AAMA 501.6, AAMA 501.4 and or engineering analysis in accordance with ASCE 7 Section 13.5.9-2.~~*

b. *The applicability of the specific AAMA 501.6 and AAMA 501.4 testing shall be subject to approval by ~~the building official~~ a registered design professional.*

f. *The window wall system using structural sealant by different manufacturer/product category shall be qualified in accordance with ~~AAMA 501.6 and AAMA 501.4~~ AAMA 501.4 and AAMA 501.6 testing for the seismic drift*

required. Analysis as an alternative to testing is *not* acceptable for the purposes of satisfying the seismic drift requirements of the SSG system when approved by a registered design professional.

Rationale:

(1) *The proposed building standards do not conflict with, overlap, or duplicate other building standards.*

- The proposed building standard conflicts with ASCE 7-10, which does permit engineering analysis for the determination of seismic drift limit.
- AAMA 501.4 is the more common test method and it is more logical, both from industry and numbering standpoint, to list first.
- "Registered design professional" is the language already in CABC 2403.2 and changing it conflicts with the CABC itself.

(3) *The public interest requires the adoption of the building standards.*

Dow Corning, as a pioneer in the science of structural glazing systems since the mid 1960's, is submitting this comment to clarify the appropriate application of AAMA 501.4 and 501.6; and to ensure that ASCE 7 Section 13.5.9 is recognized as a viable method of calculation for seismic designs so that accepted building designs in California continue to be of utmost sustainability and energy efficiency. Specifically our proposed revisions do the following:

- Clarify that the definition of serviceability from AAMA 501.4 is to be used in the application of Section 2410.1.1
- Clarify that ASCE has published viable methods by which to analyze a system's seismic capability
- Affirm structural silicone is a method by which glass is firmly supported as required in Chapter 24, Section 2403.2 of the California Building Code
 - [Broker, K.A., (2012), "Seismic Racking Test Evaluation of Silicone Used in a Four-Sided Structural Sealant Glazed Curtain Wall System", Journal of ASTM International, Vol 9, No. 5, Paper ID JAI 104144]
 - [Memari, A.M., (2012), "Evaluation of the Structural Sealant for Use in a Four-Sided Structural Sealant Glazing Curtain-Wall System for a Hospital Building", Journal of ASTM International, Vol 9, No. 5, Paper ID JAI 104143]
- Permit engineering analysis as an alternative to testing, consistent with ASCE 7 Section 13.5.9 and Section 2403.2 **Glass Supports**, of the CABC.
 - When alternative sealants are determined to be equivalent through standard accepted engineering analysis, whole system testing should not be required.
- Ensure that energy and sustainability concerns are addressed by these amendments.
 - Without the option of engineering analysis, smaller projects will, by economics, be much more apt to use dry glazed or gasketed systems. This is not appropriate for the advancing sustainability and energy requirements in construction.
 - Mechanically captured glazing systems are not subject to the proposed OSHPD testing requirements, yet perform more poorly in seismic events as evidenced by the recent Chilean earthquake [Bull, E., Cholaky, J. (2012), "A Review of the Behavior of Structural Silicone Glazing Systems Subjected to a Mega-Earthquake", Journal of ASTM International, Vol 9 No. 5, Paper ID JAI 104151]
 - In comparison with dryglazed window systems where compressed rubber gaskets are used to seal the glass pane to the window frame--structurally glazed systems--where glass panes are bonded with a silicone sealant--have better insulating properties and enable better air tightness. This leads to a reduced energy demand for heating and cooling.
 - [Brandt, B., Kletzer, E., Pilz, H., Hadzhiyska, D., and Seizov, P. (May 2012), "Silicon-Chemistry Carbon Balance, An Assessment of Greenhouse Gas Emissions and Reductions" p. 34]

- [Carbary, L.D. (2007), "A Thermal Modeling Comparison of Typical Curtainwall Glazing Systems", Glass Performance Days]
 - Serviceability and ultimate drift capacities of two-side SSG systems are significantly higher than their dry-glazed counterparts [Memari, A.M., Chen, X., Kremer, P.A., and Behr, R.A. (2006), "Seismic Performance of Two-Side Structural Silicone Glazing Systems," Journal of ASTM International, Vol. 3 No. 10, pp. 1-10]
 - Serviceability and fallout drift limits are increased significantly for glass panels that are two-side structural silicone glazed, as compared with the same glass types dry glazed [Behr, R.A. (1998). Seismic performance of architectural glass in a mid-rise curtain wall, Journal of Architectural Engineering, 4 (3), 94-98]
 - Common storefront glass types dry-glazed in a typical storefront wall system are susceptible to gasket seal degradation...sufficient to present a significant potential for subsequent air and water infiltration problems on the storefront building envelope. [Behr, R.A., Belarbi, A., and Brown, A. (1995), "Seismic Performance of Architectural Glass in a Storefront Wall System," Earthquake Spectra, Volume 11, No. 3 pp 367 – 391]
- Avoid contradiction in the CA Building Code by clarifying the role of the building official versus the registered design professional – the registered design professional is the appropriate party for determining glass support, as referenced in Section 2403.2 of Chapter 24 of the California Building Code. Also the registered design professional is typically involved at all stages of the job, whereas building official's timing may come after the point at which mockups for testing can be feasibly budgeted for and built.

(4) The proposed building standard is not unreasonable, arbitrary, unfair, or capricious, in whole or in part.

Requiring testing of all SSGs is unreasonable and arbitrary, since no technical justification for it has been provided at all.

5) The cost to the public is reasonable, based on the overall benefit to be derived from the building standards.

The cost to the public of this additional testing being required is NOT reasonable, given that no overall benefit has been demonstrated. Regardless of who bears the initial cost for the testing, eventually its get passed down to those who will be occupying and using the buildings.

(7) The applicable national specifications, published standards, and model codes have been incorporated therein as provided in this part, where appropriate.

The applicable published standards by AAMA have been incorporated, but not necessarily appropriately.

HEALTH & SAFETY CODE SECTION 18930

SECTION 18930. APPROVAL OR ADOPTION OF BUILDING STANDARDS; ANALYSIS AND CRITERIA; REVIEW CONSIDERATIONS; FACTUAL DETERMINATIONS

- (a) Any building standard adopted or proposed by state agencies shall be submitted to, and approved or adopted by, the California Building Standards Commission prior to codification. Prior to submission to the commission, building standards shall be adopted in compliance with the procedures specified in Article 5 (commencing with Section 11346) of Chapter 3.5 of Part 1 of Division 3 of Title 2 of the Government Code. Building standards adopted by state agencies and submitted to the commission for approval shall be accompanied by an analysis written by the adopting agency or state agency that proposes the building standards which shall, to the satisfaction of the commission, justify the approval thereof in terms of the following criteria:
- (1) The proposed building standards do not conflict with, overlap, or duplicate other building standards.
 - (2) The proposed building standard is within the parameters established by enabling legislation and is not expressly within the exclusive jurisdiction of another agency.
 - (3) The public interest requires the adoption of the building standards.

- (4) The proposed building standard is not unreasonable, arbitrary, unfair, or capricious, in whole or in part.
- (5) The cost to the public is reasonable, based on the overall benefit to be derived from the building standards.
- (6) The proposed building standard is not unnecessarily ambiguous or vague, in whole or in part.
- (7) The applicable national specifications, published standards, and model codes have been incorporated therein as provided in this part, where appropriate.
 - (A) If a national specification, published standard, or model code does not adequately address the goals of the state agency, a statement defining the inadequacy shall accompany the proposed building standard when submitted to the commission.
 - (B) If there is no national specification, published standard, or model code that is relevant to the proposed building standard, the state agency shall prepare a statement informing the commission and submit that statement with the proposed building standard.
- (8) The format of the proposed building standards is consistent with that adopted by the commission.
- (9) The proposed building standard, if it promotes fire and panic safety as determined by the State Fire Marshal, has the written approval of the State Fire Marshal.