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RESEARCH REPORT: RR 24637
(CSI 07920)

Expires: March 1, 2023
Issued: March 1, 2021
Code: 2020 LABC

GENERAL APPROVAL – Renewal and Clerical Modification – Dowsil™ 795 and 995 Silicone Building Sealants, Dowsil™ 983 Structural Glazing Sealant systems, and Dowsil™ 993N, 121 and 983CN Two-Part Structural Sealants

DETAILS

Structural sealant glazing systems depend on the sealant not only for weatherproofing purposes but also for structural purposes to transfer wind loads from the glazing to its perimeter supports by utilizing the cohesive and adhesive strengths of the sealants. The systems are intended to modify the glazing support requirements of the 2020 Los Angeles City Building Code for conventional systems.

Dowsil™ 795 and 995 Silicone Building Sealants are one-part silicone formulations that cure to a flexible building joint seal. Dowsil™ 983, 993N, 121, and 983CN Structural Glazing Sealants are a two-part silicone formulation that cures to an elastomeric adhesive/sealant.

Dowsil™ 795, 983, 995, 993N, 121, and 983CN are approved for structural sealant glazing systems, subject to the following requirements and restrictions:

1. To modify the glazing support requirements of the 2020 Los Angeles City Building Code, use of the structural sealants is limited to supporting and retaining only the vertical edges of glazing for windows. The retention of horizontal edges shall be in accordance with the 2020 Los Angeles City Building Code.
2. When structural sealants are used to adhere the vertical glazing edges to mullions, the mullions shall be designed to adequately resist the loads from the glazing. When a mullion is used, width of the mullion shall be not less than $\frac{3}{4}$ inch.
3. Design of the sealants shall conform to the following criteria:

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- a. To determine the bite or width of bead necessary to hold the edges of glazing to the supports, allowable tensile or bond stress of the sealants shall not exceed 20 psi as shown in the example on page 4.
 - b. Width of joints shall be designed for not less than twice (4 times is recommended) the total anticipated joint movement.
4. During installation, glazing shall be temporarily blocked to prevent it from blowing off from its mounting due to high winds or other causes. The blocking or temporary supports shall be maintained until the sealant has attained its strength to resist design loads.
5. Thickness and size of glazing shall be as limited by the 2020 Los Angeles City Building Code. Where a vertical panel joint without any mullion backing or support is used, the glazing shall be designed to span between the horizontal supports. Design stress of the glazing shall not exceed the breaking stress, under uniform loading held for one minute, divided by 3.
6. For each job where the sealants are used structurally:

Design calculations, installation specifications and details of the glazing system prepared by a civil or structural engineer or an architect, registered in California, shall be submitted to the Structural Plan Check Section for review and approval.
7. The sealants shall be applied on dry and clean surfaces. Special cleaning and priming may be required.
8. Applications of the sealants shall be in accordance with the manufacturer's instructions, a copy of which shall be provided at each construction site. Plans and specifications review and compatibility testing of accessory materials and the sealants shall be secured from the manufacturer of the sealants, by the architect or designer of the building.
9. The sealants shall be delivered to construction sites in sealed containers identified by the manufacturer's name and product designation.
10. Dowsil™ 993N and 121 Structural Sealants shall be limited to adhesion application of glass to aluminum substrates only. Dowsil™ 983CN Structural Sealant shall be limited to adhesion application of glass to aluminum and glass to glass substrates.

DISCUSSION

The clerical modification is to update the code to the 2020 Los Angeles City Building Code.

The report is in compliance with the 2020 Los Angeles City Building Code.

The Dow Chemical Company
RE: Building & Glazing Sealant

This approval is based on tests on file with the Building Research Section as listed below:

- Dowsil™ 993N and 121 specification properties determined per ASTM C1184: Standard Specification for Structural Silicone Sealants.
- Dowsil™ 983 CN tensile adhesion strength determined per ASTM C1135: Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants.

Installation shall be strictly as per manufacturer's specifications.

The manufacturer of the sealants does not recommend use of the sealants on materials that bleeds oil, plasticizer or solvents, on treated wood, on vulcanized rubber, in totally confined spaces since atmospheric moisture is required for curing, where painting of the sealant is required, in below-grade applications, in horizontal joints where subject to physical abuse or abrasion and under continuous immersion in water.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this Approval have been met in the project in which it is to be used.

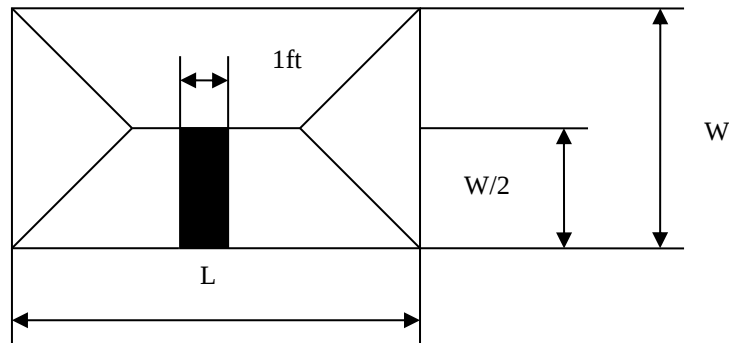
Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

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I. To calculate the sealant surface contact required:

1. The design strength in the sealant is 20 psi.
2. The distribution of the force on a lite of glass is best approximated by the trapezoidal distribution as shown below.



3. The calculation to determine sealant surface contact required , referred to as “bite” is as follow:

$$\text{Bite(in)} = \frac{\frac{W}{2} (ft) * \text{windload} (psf)}{20 \text{ psi} * 12 \text{ in} / ft}$$

- a. Force on the shaded area
Wind force (lbs) = Wind load (psf) x $W/2$ (ft) x 1ft
- b. Sealant surface contact required
Bite(in) = Wind force (lbs)/ (20psi * 12in)

II. Example calculation is:

Given: Glass size 5’x7’
 Wind load 50psf

Solved:

1. Wind force = 50psf x (5ft/2) x 1ft = 125 lbs
2. Bite = 125lbs/(20psi x 12in) = 0.52 in