

**QUALITY ASSURANCE PROGRAM
FOR
THE CYGNUS PANEL SYSTEM**

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**CYGNUS PANEL SYSTEM
QUALITY ASSURANCE MANUAL**

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Program

The quality assurance program to be followed in the fabrication and erection of the Cygnus panel has been developed for Cygnus with the cooperation of the following firms:

KKBNA, Inc., Structural Engineers, Denver, Boston, Costa Mesa,
Chicago, St. Louis, New York, Salt Lake City

Wiss, Janney, Elstner Associates, Inc.

Consulting and Research Engineers

Chicago, San Francisco, Princeton, Honolulu, Denver, Dallas

Dow Corning, U.S.A. Construction

Products Technical Service and Development

Midland, Michigan

Design

The panel system shall be designed and built according to the following references.

1. ASTM A36 Structural Steel, Latest Edition
2. AISC Specification for the Design of Cold Formed Steel Structural Members, Latest Edition.
3. AISC Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings Latest Edition.
4. AWS D1.1 Structural Welding Code, Latest Edition.

Design Procedures

Steel: Form from steel conforming to ASTM A570 Grade E with minimum yield point of 50 KSI for 16 gauge and ASTM A611-97, Grade C with minimum yield point of 37 KSI for 18 gauge. Angles conform to ASTM F1554-99, tubes to ASTM A500-99 or A501-99.

Materials

Steel Deck: Form from steel sheets conforming to ASTM A611-97, Grade C.

Hot-dipped galvanized conforming to ASTM A653 for zinc-coated deck G-60, 22 gauge type B or F.

Panel Structural Sealant: Dow Corning 795 or approved equal.

Panel Sealant: Dow Corning 795 or approved equal

Tape: Vinyl or polyethylene 1/8" x 1 1/4". Tape to be compatible with sealant used.

Backer Rod: Round flexible extruded polyethylene foam.

Cladding: As selected by architect or owner.

Cleaning Solvent: Xylene, Toluene or Acetone.

TEKS Screws: Screws shall be corrosion-resistant material placed as required by the design engineer.

Materials Procedures

1. Compatibility testing: Deck, cladding material and silicone. Three pieces of the decking and three pieces of the cladding material which are representative of the materials used on the project should be sent to Dow Corning, Construction Products Technical and Service and Development Department, in your geographic area, for adhesion testing of these samples with Dow Corning 795 Silicone Sealant. The size of these pieces sent should be 4" x 6".

The results of these tests should be made a part of the job log book. A test for migration of silicone should also be conducted and will require four pieces each 2" x 6" to be sent to the above address.

This can be accomplished through Dow's local sales or technical representative, or through the technical arm of the company from which you purchased the silicone.

2. 795 Silicone Sealant

Dow Corning 795 has a six month shelf life from the date of shipment. It must be stored at temperatures below 80 F or this shelf life could be shortened. Set up a log book for the job and note the lot number of the 795 Dow Corning and the date it arrived. Follow the manufacturers instructions for sealant other than Dow 795. In the same log book record the results of the following tests:

- (a) Spread a 1/16" to 1/8" thick film of 795 on a sheet of polyethylene. Allow this sample of sealant to cure for 24 hours. Record start time in log book. After 24 hours peel the piece of sealant off the polyethylene sheet. Stretch the sealant slowly to see that it is cured and contains the characteristics of an elastomeric rubber. (The sealant should stretch and return to approximately the original length.)
- (b) If the sealant does not cure according to the guidelines described in this procedure, do not use the sealant in a structural application.
- (c) Re-test any sealant that is not used within 30 days.
- (d) This test should be conducted for each lot number of Dow Corning 795 received.

3. Cleaning

The assembled steel frames should have those surfaces to which the tile is adhered cleaned as outlined below.

- (a) Use clean, soft, absorbent cloth.
- (b) Pour solvent on the cloth.
- (c) Vigorously rub the metal to remove contaminants.
- (d) Continuously rotate the rag to lift off and remove the oils loosened by the solvent.
- (e) The solvent should not be allowed to evaporate and dry on the surface. The surface should be dried with a clean absorbent cloth.
- (f) Temperature and humidity conditions will affect the evaporation rate of the solvent.
- (g) Never use a paint brush for cleaning, it will not absorb and remove the dirt and oil.
- (h) Cleaned surfaces must be protected from further contamination from oil and dust.

Application of Structural and Joint Sealant

A uniform bead of structural sealant should be applied to the cleaned metal surface. A symmetrical loading pattern is necessary. Seven square inches of contact between the metal and cladding is required for proper structural performance of the system when ceramic material is used. If silicone is being used with the stone composite system, a design load not exceeding 20 psi should be followed. The surface contact being achieved should be checked repeatedly until the persons applying the material reach consistency. Because the cladding may vary in thickness and plane, great care should be taken at this time.

Follow results of compatibility tests with respect to the use of a primer.

Sealant should be forced into the joint. Sealant should be removed from cladding face before it cures. Isopropyl alcohol can be used for this cleaning when using Dow 795.

Cladding should be cleaned with absorbent cloth and any of the previously above named solvents. All loose material and dust should be removed from the backs and the sides of the cladding before it is placed.

Curing Time

Full curing of the structural sealant will vary with product used as well as temperature and humidity. Panels should not be moved in a manner that would cause the cladding material to move or shift. The structural sealant should be able to carry twice the dead load of the cladding material before the panel is moved in a manner to cause this dead load to be applied to the sealant. If a Cygnus Mechanical Fastener/Leveling Device is being used, the fastener will carry these loads.

Testing

When manufacturing panels used ceramic materials and the structural silicone has attained its design strength, at least two panels shall be selected from each days run and two pieces of cladding on each panel shall be subjected to one and one half times design load by means of a suction assembly with force gauge attached. The results of these tests shall be dated and entered in the job log book. Lack of sealant adhesion or cure may be identified by tile displacement from its original position.

The job log book would be made available upon request to the architect or his representatives and to Cygnus. A representative from Cygnus will be present at the start of licensee's first project to assist in the instruction of the licensee's personnel in the procedures outlined in the manual. This instruction shall continue until Cygnus has ascertained that those responsible for the program are fully acquainted with it and the operation is being carried out within its guidelines.

Joint Sealant Testing

After the panel has achieved its full curing time, the joint sealant should be tested in a manner recommended by the manufacturer of the material. This test should always produce a cohesive failure in the sealant material prior to the separation of the sealant from the cladding.