S.C. Johnson Wax

Can Technology Improve a Frank Lloyd Wright Design?

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The Frank Lloyd Wright designed S.C. Johnson & Son Administration Building began its unique trek into history in 1936. The 15-story Research and Development Tower followed in 1946. Many consider the buildings architectural masterpieces, one of the crowning achievements of 20th century architecture. Constructed of "Cherokee-Red" smooth-faced brick, concrete, and Pyrex glass tubing, the designs were certainly innovative of the time. Wright is credited with designing a "center of creativity", a place where great ideas would flourish and be shared.

Frank Lloyd Wright believed that the employees attention should be focused on their work. They were not to be distracted by views through windows. This, along with an uninspiring site in an industrial area, led to his decision to replace conventional windows with clerestories and skylights.

He was also intent on flooding the rooms in natural light. His initial designs excluded artificial lighting. Wright felt a translucent material would let light in and give no view. Looking for a translucent type glazing material, he experimented with both glass blocks and plastic sheets. The design evolved into a type of glass tubing product. Wright selected Pyrex, a glass tubing developed by Corning Glass Works. (now Corning Inc.) Pyrex could be molded into angles and curves, creating rounded corners and curvilinear shapes. This would give the impression of a streamlined, "aerodynamic" building, a style he used in his residential construction. His next set of challenges would be keeping the design watertight.

The final designs for both the clerestory windows and skylights called for Pyrex tubing to be stacked and wired into metal frames. To seal the joints between the tubes and at the butt ends, he selected a mastic made by Vulcanite. Unfortunately, in the 1930's and 1940's sealant technology was still in its infancy. Due to the expansion and contraction properties of the tubing and the mastic's lack of movement capabilities, the joints often leaked. The skylights were especially susceptible to leakage due to ponding water. Over Wright's objections, a plate glass system was installed over the skylights until a more suitable product could be found.

Frank Lloyd Wright's design for the Research tower again called for a brick, concrete, and Pyrex tubing façade. As the Research tower construction began, Wright had yet to determine how to seal the Pyrex. Dozens of caulks and cements were tested unsuccessfully. A design was finalized using a molded PVC gasket between the tubes and as a butt joint seal. The PVC gaskets, named Koroseal, were manufactured by Corning Inc. The PVC gasket materials were supplied by B.F. Goodrich. Initially, the new design worked; however, due to the tube weight and thermal movements, the gaskets had to be replaced. In 1950, S.C. Johnson engineers decided to caulk 100,000 l.f. of the gaskets with a new noncuring synthetic rubber compound.

Within 3 years, the compound failed. The engineers then decided to look to Dow Corning Corporation for help. (Dow Corning Corp. was formed in 1943 as a joint venture between The Dow Chemical Company and Corning Glass Works) For 3 years, they tested a variety of materials. In 1958, the Dow Corning Company developed a one-part silicone rubber sealant. The sealant was used to recaulk the Pyrex construction in both buildings. The silicone sealant used is considered a forerunner to the current Dow Corning® 999-A Silicone Building and Glazing Sealant.

For the past 45 years, Dow Corning® Silicone Sealants have been the preferred sealants for all caulking in both buildings. Dow Corning® 999-A and Dow Corning® 790 are the sealants of choice for use in their maintenance programs. Dow Corning® Silicone Sealants have been there prolonging the beauty and life of this great structure, a piece of art. The SC Johnson track record of innovation has driven their success since the buildings were constructed.