

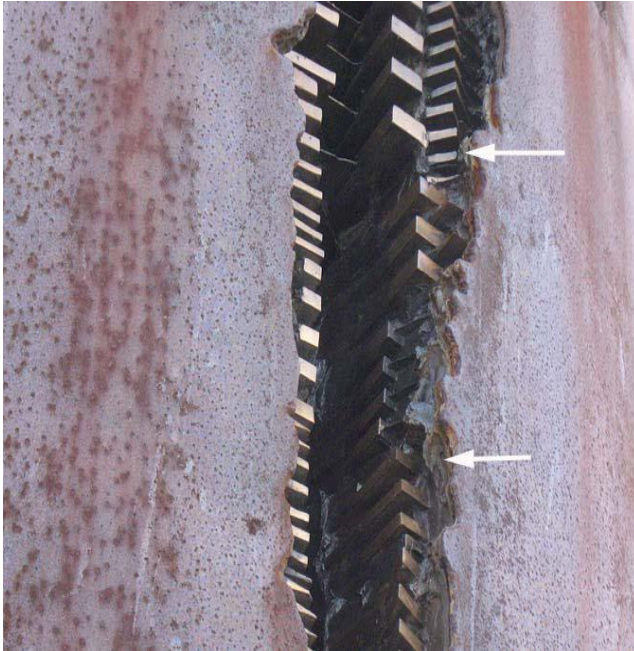
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## **Restoration of Italian Sculptor Arnaldo Pomodoro's Triad at the PepsiCo Headquarters in Purchase, NY**



PepsiCo, the makers of Pepsi-Cola, Gatorade, Tropicana, Quaker Oats, and Frito Lay, currently have their world headquarters located in Purchase, NY. On the grounds is the 168 acre Donald M. Kendall sculpture garden, dedicated to the former PepsiCo CEO. This sculpture garden contains 45 pieces of artwork and is meant to provide an atmosphere of stability, creativity and experimentation that would reflect Donald's vision of the company.

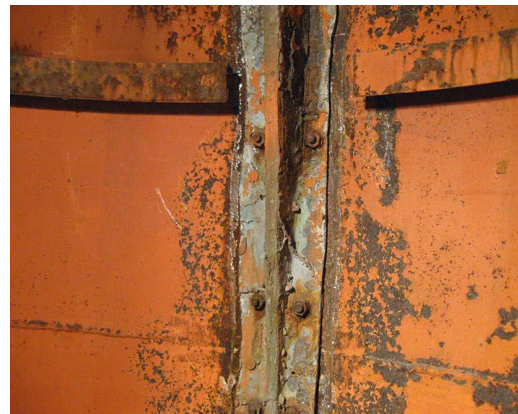


Within the garden is the Italian sculptor Arnaldo Pomodoro's *Triad*, three 6' diameter, 60' tall cylindrical sculptures. *Triad* was installed in 1979 and one of the three columns is beginning to deteriorate from corrosion. The corroding sculpture is a vertical, hollow cylinder made from Cor-Ten low alloy weathering carbon steel, with cast bronze 'dendrite' shapes bolted internally to be visible in sculpted windows. Minor alloying additions of chromium and copper give these low alloy steels higher strength and improved resistance to atmospheric corrosion compared to regular low carbon structural steel (e.g., ASTM A36).

Alloying with copper increases the physical stability of the corrosion product (patina) formed in mostly dry atmospheric exposure, minimizing formation of scales of rust that exfoliate from regular structural steel. However, weathering steel corrodes similarly to regular carbon steel when the time of wetness is prolonged, such as in crevices and pockets that retain water (from rain, snow and condensation). Weathering steel is sensitive to polluted and salt-laden atmospheres, which compromise the stability of the rust patina.

*External inspection* revealed a normal, uniform rust patina on the boldly exposed convex surface, including good color uniformity on the North and South sides. Extra corrosion product stains "run down" from the sculpted openings. Close examination of the edges at the openings reveals layered rust scale between the steel and the bronze castings, as expected for locations where water is trapped. When inspected internally, excessive corrosion was found where the orange primer failed as well as along the bronze casting connections. Some of the gaps were open to the outside.

Rust scale exerts substantial prying force – estimated in excess of 10,000 psi – on the steel edge. Steel corrosion deeper in the gap exerts the prying force on the bolts holding the bronze castings in place. If this gap was initially caulked, no caulking material was present at the time of the inspection. Steel corrosion at cutout edges may initially have been galvanically accelerated by electrical contact with the bronze, but the observed corrosion would arise anyway due to the poorly draining geometry.



We worked with Dave Bennet of Corrosion Probe to find a solution to remove all of the existing corrosion and to control the future corrosion of the sculpture. Because we were working with a piece of art, aesthetics were very important. To remove corrosion we would typically use abrasive blasting, but to ensure that no damage was done to the sculpture we decided to use an ultra high pressure water jetting unit capable of reaching pressures up to 36,000 psi. We used a 0 degree demolition tip which is typically used for cutting. This tip being used with such high pressure yields the potential of damaging the steel and bronze casting. So we had to find a balance between cutting through the corrosion without harming the sculpture. After experimentation we found that water jetting at 20,000 psi was the optimal pressure. No containment was necessary using this system, but because



this was a public headquarters there were many people and children present. To maintain a safe work environment we had a large designated work zone with a ground man making sure the work was completed safely. We used rubber mallets on the exterior surface of the sculpture to loosen the corrosion and the water jet to remove it completely.

In order to prevent future corrosion, the Cor-Ten steel and bronze layers needed to be isolated from each other. We applied Denso Paste followed by Densyl Mastic, both products from Denso, by hand between the steel and bronze layers. Densyl Mastic is a cold applied self-supporting mastic for sealing, filling and caulking applications where a protective, waterproof and non-setting mastic is required. Over the course of two weeks we were able to reverse the damage of over 30 years of corrosion on Arnaldo Pomodoro's famed *Triad*. Now the sculpture will continue to be enjoyed for many more years in its original condition.