LAST BARREL STANDING

Plastic barrel racks prove to handle earthquakes better than steel

Barrels stacked on plastic racks in Napa cellar close to the epicenter of the August 2014 quake.

Bob Williamson, owner and founder of Ideology Cellars, knew he had found something special when he first discovered a plastic barrel rack to use in lieu of his old steel racks. Besides the obvious benefit of corrosion resistance, and the added reduction in related maintenance costs compared to the painted carbon steel racks, he was also attracted to the environmental sensibilities of the product, which is 100% recyclable.

The unexpected benefit of the plastic racks was their pliable material construction. "The plastic racks are somewhat flexible and grab the barrels with more surface area," said Williamson, " and the plastic material is gentler on the barrels and doesn't scratch the cellar floors, like the steel racks."

However, the ultimate benefit of the plastic rack construction was not realized until August 24, 2014, when the Napa Valley experienced their strongest earthquake in 25 years. In the aftermath of the quake, Williamson visited the cellar storing his barrels to survey the damage, and couldn't believe his eyes. Standing by itself in a sea of collapsed steel barrel rack stacks was a single stack of plastic barrel racks. "It was unbelievable. I don't think a professional photographer could have photo shopped the cellar setting any better."

Bonar Plastics, a manufacturer of plastic barrel racks, was skeptical of William's photo, but had received similar feedback from other customers, and felt the performance reports made sense. "We had always thought that the plastic barrel racks would perform better than steel in a seismic event, based on

our vibration and drop testing of other products, but we had never conducted any earthquake tests." said Cullen Jones, Director of Sales and Marketing at Bonar Plastics.

While the real world earthquake experience and positive feedback from customers was exciting, Bonar management needed to know if these results were a fluke, or did they possibly have an unplanned advantage in earthquake zones. The Napa earthquake was a popular topic at the most recent Unified Wine and Grape Symposium last January, and Bonar personnel decided to pursue a quantitative controlled test environment to confirm the real world results. "During the Unified Symposium, we learned from the folks over at Constellation Brands, who had similar issues with their 2 barrel steel barrel racks, that the University of California, Berkeley, has a testing facility to simulate historical seismic activity," said Jones.

Shortly thereafter, Bonar expedited seismic testing at UC Berkeley's Pacific Earthquake Engineering Research Center (PEER) in early March, and confirmed that the real world results were indeed no fluke. In summary, Bonar's 2 barrel plastic rack passed 125% of the Napa quake's energy at the epicenter with barrels stacked 6 high. "We actually would have passed at a 150% or higher on the Loma Prieta earthquake test, but we neglected to rotate the bottom rack, which had sustained some damage after being exposed to five other tests prior," said Jones. The Loma Prieta Earthquake was in 1989, and responsible for 63 deaths, and 3,757 injuries.

Barrels stacked 6 high on plastic racks after 125% of Napa quake energy.

Barrels stacked on steel racks would only pass 75% Napa quake energy. Photos: UC Berkley PEER Test Center

In comparison, the steel 2 barrel racks could only pass the Napa quake test at 75% of the seismic energy. "The results were pretty conclusive." Jones added, "The plastic material construction enables the rack and everything on it to absorb more energy, which places less stress on the expensive wine barrels, and a benefit even during routine barrel handling and stacking operations."

Plastic barrel racks have been on the market for over 5 years, but have yet to gain any significant market share in the wine industry. "The wine industry is a little slower than most in making changes." Jones continued. "The value proposition of a plastic rack has always been compelling from a useful life, corrosion resistance, and environmental standpoint, so maybe the now proven added earthquake safety and asset protection advantage will drive more conversions."

"It's just a matter of time before the big wine companies take the next step, as it makes too much sense over the long term to ignore the many benefits of a plastic rack." Jones concluded.

Plastic barrel racks are also corrosion resistant, recyclable, and gentler on barrels and cellar floors.