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Materials Testing Needs*

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## Pryor Giggey upgrades refractory castable cold crush testing with ADMET MegaForce II

Pryor Giggey Co. was founded in 1948 by E.K. Pryor and T.E. Giggey as a refractory distribution business in Santa Fe Springs, California. It has since grown to become a leading refractory manufacturing and sales organization, headquartered in Anniston, Alabama, with additional manufacturing in Chehalis, Washington.

The company serves many industries, such as steel, iron, aluminum, power generation, petrochemical, cement, copper, glass and foundries. It offers over 700 refractory products and precast shapes, including conventional, low cement, ultra-low cement, self-flowing, insulating, and gunning castables, plastics, mortars, patches, and dry vibratables.

Pryor Giggey Co. has always placed major emphasis on quality and customer service. It maintains an active program for developing and testing its own products. Included in this program are both R&D and production strength testing of refractory castable concrete cube samples. To improve its production testing, Pryor Giggey recently retrofitted a Soiltest materials testing frame with an ADMET MegaForce II Automatic Testing System and is happy with the results.

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Pryor Giggey Co. (PGC) is a leading supplier of refractory materials, including castable concrete, plastics, mortars, and dry vibratables, used in a wide range of heavy industries. Its products, generally sold in dry bulk form, are cast by its customers into the forms needed for their products.

The Anniston, Alabama-based company has additional manufacturing in Chehalis, Washington. The company performs several quality tests on its various formulations. Materials strength testing is one of PGC's important quality measures.

Explained Tim Austel, Research Engineer at the Chehalis plant, "Crushing is an indicator of

overall product strength and quality. It is an additional way to characterize the product."

The cold crush test uses 2" cube cast specimens that are cured at 220°F or 1,500°F and then cooled. The cubes are tested to ASTM C133, which defines the cold crushing strength and the modulus of rupture (MOR) of refractories. PGC tests every fourth batch of 3,000 lbs unless customers request more frequent testing.

Cold crushing strengths on the products manufactured in the Chehalis plant range from 5,900 to 22,000 psi.

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### **SOLUTION OVERVIEW**

**Industry:** Castable refractory concrete  
**ADMET Product:** MegaForce II Automatic Testing System retrofit of Soiltest frame

**Customer:** Pryor Giggey Co.  
**Application:** Cold crush concrete cubes.

## Introduces digital controls

PGC performed the cold crush testing on an old analog 250,000 lb Soiltest machine. It had been updated with a digital indicator in the '90s after the dials malfunctioned.

The original pumping system was not replaced and the process remained essentially manual. The operator controlled the entire test from preload through reset by watching and responding to readings on the digital indicator.

ASTM specifies two loading rates for the castables that PGC produces. "We didn't try to preload because it was such a hassle to watch the numbers and the clock," said Austel. "The operator would set it to what looked like the preload value and then go the whole length of the test."

## ADMET understands refractory testing

PGC decided to replace or upgrade the machine, but they had trouble finding a company that was familiar with ASTM C133 refractory cube testing. Most knew only concrete cylinder testing (ASTM C39) which is performed on larger samples to different standards.

Austel contacted ADMET, which often retrofits machines, and discovered that the sales engineer understood "exactly what we were trying to do."

Austel sent digital photos to ADMET and, based on the photos, the sales engineer confirmed that ADMET could do the retrofit. ADMET made arrangements with a local calibrator, Adtek of Boring, Oregon, to do the installation.

ADMET submitted a proposal for a MegaForce II Automatic Testing System to replace the entire Soiltest hydraulic system. The

Soiltest frame would be the only remaining original component.

The proposal was accepted and the parts were ordered. The actual installation was completed in one day by Adtek.

## Automated process

Now, the entire test procedure is automated. Commented Austel, "Before, the operator would have to sit there and watch the machine. Now, he puts the cube in the machine and closes the door. He knows that the preload, the test time -- everything was done right and the number is waiting for him."

Productivity is much higher. The operator saves about five – six hours on the 60-70 tests that he does each week.

The first proof was in the way the backlog was handled. The technician caught up in a few weeks. "I couldn't count the number of cubes we had to test because we continued to manufacture while the machine was down. We had a pallet of cubes. I thought it would take him a year-and-a-half to keep up with production and catch up on the

backlog. He flew through them. I was amazed every day that I went out there to look at the pallet," said Austel.

Now, the Anniston plant is sending some R&D samples to Chehalis to take advantage of the Soiltest's greater accuracy.

Next up is a replacement of the Anniston plant's 60,000 Tinius Olsen machine with a larger capacity unit. The new testing system will take advantage of digital controls to increase efficiency and accuracy.

