



*For a Total Solution to all of your  
Materials Testing Needs*

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## ADMET centrally controls three Terracon compressive test machines

Terracon is a leading provider of geotechnical, environmental, paving and construction materials consulting services, as well as facilities engineering services. Based in Lenexa, Kansas, the employee-owned firm has been providing quality services since 1965. Terracon has more than 95 offices in 33 states and has completed projects nationwide for clients in agriculture, commercial development, finance, industry, oil & gas, site redevelopment, public works, telecommunications and transportation. Terracon's office in Las Vegas is increasingly called on to test high-strength materials used in high rise buildings. Its analog compressive test frames were out of date and needed to be replaced or retrofitted with modern controls. Ron Ludwig, Director of Construction Services for Terracon's Las Vegas operations, made the decision to revamp the concrete testing laboratory and install a central controller and hydraulic pumping system. Terracon's test frame vendor, TestMark, turned to ADMET for its LX 5000 controller and MegaForce pumping system to centrally control the lab's three machines.

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Terracon is a dynamic and growing consulting firm that provides multiple related service lines for a wide range of construction projects throughout the U.S. It supports these projects with 90 regional testing labs that help ensure that the materials delivered to construction sites are correct and in accordance with ASTM (American Society for Testing and Materials) standards.

The 80-person regional Terracon office in Las Vegas supports infrastructure and commercial construction in one of the fastest growing markets in the country. The office conducts a wide array of construction materials field and laboratory testing, construction materials inspection, and materials consulting. The geotechnical department performs subsurface explorations to obtain soil samples in order to provide recommendations for foundation designs.

The busy testing laboratory, staffed by up to eight technicians, tests concrete and aggregate materials for roadways, bridges, commercial buildings, warehouses and high rises, including casinos that often have dramatic designs requiring high-strength concrete formulations.

Three of the technicians are dedicated to retrieving samples from the field, logging in the samples, maintaining the curing facility, and compressive testing of up to 120 concrete samples per day.

### **Keeping pace**

The lab recently upgraded its compressive strength test frames to keep pace with the progress in building materials. Explained Ron Ludwig, Terracon Director of Construction Services, "Prior to the last three-to-four years, typical strength requirements were from 4 to 6,000 psi. With new designs and new seismic requirements, as well as the size of the structures that we're doing out here, we have to get more strength out of the concrete. Designs are requiring strengths as high as 8 to 9,000 psi and by the time the suppliers do their required over-design we frequently break samples in the 10 to 11,000 psi range."

To keep up with the volume and new materials, Terracon decided to retire one 440,000 lbf frame that

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## **SOLUTION OVERVIEW**

**Industry:** Construction

**ADMET Product:** LX 5000 digital controller and MegaForce hydraulic pumping system

**Customer:** Terracon

**Application:** Testing concrete molded and cored specimens, grout, mortar and prism samples

had worn out, add digital controls to a second, 660,000 lbf ELE frame, and add two new TestMark frames -- a 20,000 lbf and a 400,000 lbf.

The equipment changes had three objectives: to place appropriately sized test frames in the lab; to move to a fully digital environment; and to increase efficiency. Of course, cost was also a consideration.

### A single digital controller

To accomplish the objectives, Ludwig decided to use a single digital controller and hydraulic system for all three machines.

“Using one control seemed to make sense. The machines are all in a line in the same area of the lab. Rather than duplicate the pumps and all of the controls, we felt it would be better to have one control panel and a simple means of switching from one frame to the other,” said Ludwig.

TestMark worked with its controls supplier, ADMET, and Cal-Cert, the calibration firm that services Terracon’s equipment. ADMET designed a system that uses its LX 5000 digital controller to control an ADMET MegaForce electronically

operated pumping system. This is a standard configuration for concrete testing.

In this case, however, the MegaForce pump feeds into a manifold that connects to each of the three machines. This enables Terracon to use a single control and pumping system for all of the machines.

### New system, new approach

Now, technicians have a fully automated, three-machine based digital compressive test system. Much of the testing is on the new 400,000 lbf TestMark. Small cores and mortar samples are tested on the 20,000 lbf machine, which is also used for flexural tests. Prism samples, such as stacked concrete blocks, continue to be tested on the retrofitted 600,000 lbf machine because it has an extended frame.

The operator simply opens the valve for the machine that will be used and selects the appropriate load rate for the machine. The LX5000 performs a fast pre-load, controls the test to failure according to ASTM C39 specifications and then resets for the next test.

The LX 5000 captures the peak load at the conclusion of the test and converts the result to psi. The value is transferred into a form for entry into a Terracon-developed data and project management program and assigned to the project. The system also generates a report of all of the day’s breaks as a double check.



ADMET MegaForce II

“There are generally 2-4 copies of the report for each sample that are mailed or emailed as attachments to the interested parties – the owner, contractor, the structural engineer, the ready-mix supplier,” commented Ludwig.

The new integrated test system has performed well for over a year. “We’re totally pleased with it. It’s in service six days a week and we’ve had no problems,” concluded Ludwig.

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### For more information

For more information about ADMET products or services, please call us at 800-667-3220 or 781-769-0850, email [sales@admet.com](mailto:sales@admet.com) or visit our Web site at <http://www.admet.com>.

For additional information on Terracon, visit <http://www.terracon.com>, call 800-593-7777, or email [corporate@terracon.com](mailto:corporate@terracon.com).

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