



TEST WITH CERTAINTY. TEST WITH ADMET.

UMass Biomechanical Research Relies on ADMET

The University of Massachusetts Medical School in Worcester is highly respected for its research. One area of inquiry, biomechanical for orthopedics and physical rehabilitation, relies on an ADMET eXpert 2611 (10kN) tabletop Universal Testing Machine for testing various hip fracture models that are then used to validate a device that measures fracture healing. The sponsored research utilizes plastic bones and various orthopedic implants to determine load sharing between the bones and the implants. The ADMET machine is also being used for other research projects.

The University of Massachusetts at Worcester is home to the University of Massachusetts Medical School. UMMS hosts a number of outstanding research programs that have been recognized by both national and international medical communities.

The Department of Orthopedics and Physical Rehabilitation along with the Division of Rheumatology, form the Musculoskeletal Center of Excellence. The Center focuses on clinical care and research for the prevention, diagnosis, treatment and rehabilitation of musculoskeletal disorders.

The Center conducts several research projects. One sponsored project, run by John Wixted, MD, is conducting fracture biology research to validate a device that measures fracture healing properties of various orthopedic implants by determining the load sharing between bones and implants. The team includes medical practitioners, as well as engineering personnel at both UMMS and Worcester Polytechnic Institute.

Selecting a Testing Machine

The project required a tension-compression testing machine, commonly referred to as a Universal Testing Machine (UTM), to conduct tests to failure. Wixted checked on the Web and found ADMET and several other suppliers.

He was impressed with ADMET on several levels. "We researched various machines, and for the price and capabilities, we thought that ADMET was pretty reasonable," said Wixted.

"They were good about their recommendations, too. Originally, I was going to go with a different machine and they made some suggestions based on what I told them about the application. They were easy to work with that way."

Wixted ordered an eXpert 2611 with appropriate fixtures controlled by the ADMET MTESTWindows™ Materials Testing System.

"We bought the system for \$15,000 or \$16,000 complete. You can barely get a retrofit machine for that price," he said.

"They've also been very good with the customer service end of things. Whenever I call

SOLUTION OVERVIEW

Industry: Biomechanical Research

ADMET Product: eXpert 2611 with MTESTWindows™

Customer: University of Massachusetts Medical School

Application: Fracture biology research

with a question, they're very good about getting right back to me with an answer."

Validating Sensor Measurements

The tests involve adding sensors to human hardware implants used in hip fracture repair. Explained Wixted, "We're interested in the load-sharing capacity of the hardware that's used to fix fractures. We're using the machine to test the capabilities of the hardware to hold these hip fractures back together – how much work is the bone doing, how much work is the hardware doing as the bone becomes intact. We want to validate the use of the sensors."

The tests simulate hip fracture models using the plastic bones. Wixted does osteotomies to compare partially osteotomized, completely osteotomized, or intact specimens. He also varies the angle of the osteotomies.

"What we're doing is taking plastic bones and we're cutting them at various depths and angles, and looking at the differences on how our sensors read based on the angle and completeness of the osteotomy."

The hardware implant is then fitted to the osteotomized plastic bone specimens and the assembly is mounted into the ADMET system for tension/compression testing.

Following the testing with plastic bones his research moves to catameric human bones and will eventually move to a large animal model.

MTESTWindows Gathers Data

The test data is collected and reported by the MTESTWindows system and then transferred from MTESTWindows to a Microsoft Excel spreadsheet.

Commented Wixted, "It's pretty straightforward. The machine will do a lot of the calculations for us. But, for the work that we've been doing, we switch between MTESTWindows and the Excel spreadsheet. We do lots of graphs and are able to easily compare test results."

As this research program is coming to completion, Wixted is already using the ADMET system for other biomechanical projects related to prophylactic pinning of the femoral neck and hardware designs for pelvic fractures.

"I've been very happy with the ADMET system from a cost basis, ease-of-use and ongoing support. It does what we need it to do," concluded Wixted.

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 or visit our Web site at <http://www.admet.com>.

For additional information on the University of Massachusetts Medical School <http://www.umassmed.edu/index.aspx>.

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