

TechNotes

Getting the most up-to-date information on materials testing

2014

A YEAR IN REVIEW



INSTRON®



5969



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Dear Readers,

I'm excited to share with you our second annual *TechNotes: A Year in Review* issue, highlighting our hard work and commitment as we strive to not only deliver exceptional products, but nurture the relationships we have with our most important asset – our customers.

Customers like you are at the very core of Instron's culture and every day we look for new ways to provide innovative solutions through new product development, and provide forward-thinking, thought leadership through industry-trending articles, newsletters, and webinars.

As the Editor of *TechNotes*, I aim to deliver to you the knowledge and innovative solutions that are developed by Instron's industry experts. My hope is that this issue will encompass all that we've done throughout the year and highlight the many ways this work has been inspired by you, our customer.

Thank you for your support and interest in *TechNotes*. I look forward to continued communication with you during 2015!

Best regards,

Denise Czerpak

TechNotes Editor

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It is imperative for us to purchase a system today that gives us the ability to perform all types of tests in the years to come.

~ Angie Miller
PRA

THE CUSTOMER REPORT: ACHIEVING STRATEGIC SOLUTIONS

PRA Case Study | Surface Coatings | Hampton, UK

Founded in 1926 as a membership organization and independent test house, PRA now functions as a commercial company. As part of a larger organization called PERA, PRA focuses on new product development and research for customers ranging from paint manufacturers to the raw materials suppliers to the end user. This new area of focus is in addition to offering technical consultancy, business intelligence, and continuing to act as an independent test house to the industry.

The Challenge

As a company that serves a multitude of customers, PRA started to experience an increase in their workload. Although this is what every company strives for, they found themselves under distress as their testing system, which was 34 years old and no longer supported, stopped working. Angie Miller, PRA Technical Manager, realized that they were able to outsource the testing part for their customers, although this was not an ideal situation. They didn't want to lose out on new projects.

PRA focuses on new product development and research for customers

"We need the ability to quote more work. If we're able to have the ability to test in-house, that's what we want to do. Purchasing a system with up-to-date technology—one that has endless opportunities for our immediate needs, as well as for future prospects—is what our lab is currently researching" says Miller.

Recently awarded an important new project that could not be outsourced, Miller began to research

solutions that allowed PRA a vast range of flexibility and capability. The decision to "future proof" their lab was based not only on this new project, but the needs and demands their customers will one day require.

"It is imperative for us to purchase a system today that gives us the ability to perform all types of tests in the years to come," says Miller.

Another factor of consideration was a solution that could utilize their existing grips from their previous testing system — allowing PRA to stay on task with the broad range of their current testing capabilities.

The Solution

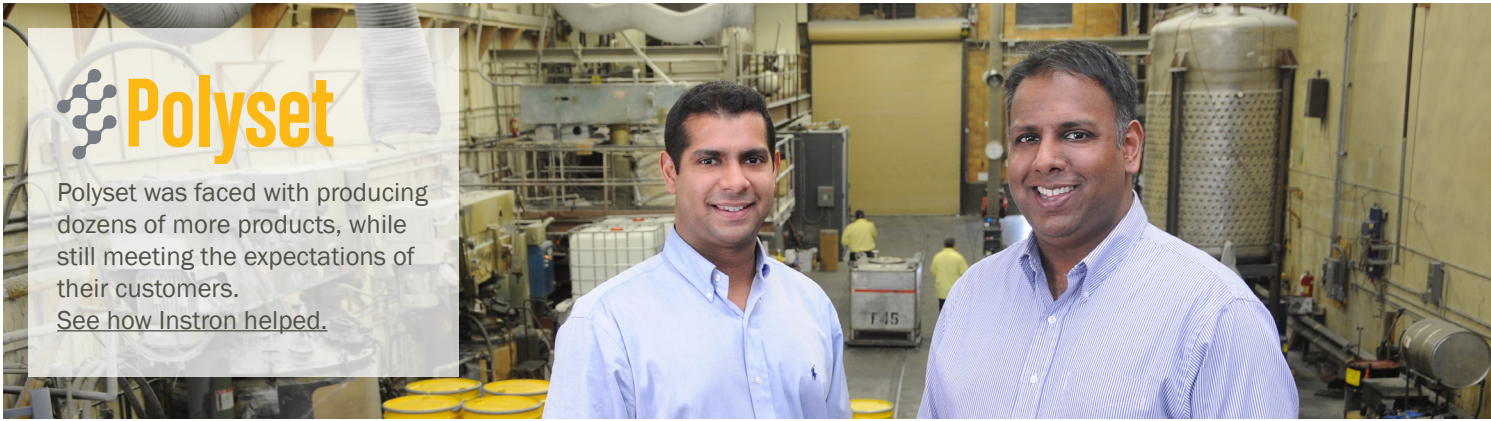
Keeping their "must have" list in mind, PRA met with their local Instron team and decided to purchase an Instron® 5967 for their research needs. The versatility of the system offered the flexibility for PRA to use their existing grips and to add-on various accessories—along with way—that fit with the future needs of their customers.

"It's been great ... after the system was installed and we received our training, we've experienced no hiccups with the system or the software," says Miller.

The Results

Using the 5967 system for nearly 9 months, PRA has been making good headway on their current project. And because the instrument is so versatile, they are realizing that they don't need to purchase all accessories or add-ons at one time, but only when new work comes in.

This ability to add additional capability when needed gives PRA the chance to quote a vast range of projects and to broaden their technical offers, while being able to save money.



Polyset

Polyset was faced with producing dozens of more products, while still meeting the expectations of their customers.
[See how Instron helped.](#)

Nil Ghoshal and Raj Ghoshal, Co-Principals of Polyset



Advanced Manufacturing Research Centre



To be the partner needed to research and resolve advanced manufacturing problems for their customers, AMRC realized they needed to expand their testing capabilities.

[Read how they accomplished this.](#)



They started to look for a partner—not only a materials testing supplier, but one that was willing to work with them and to help educate them as they were going into a new world of testing.

[Read how Instron stepped in.](#)



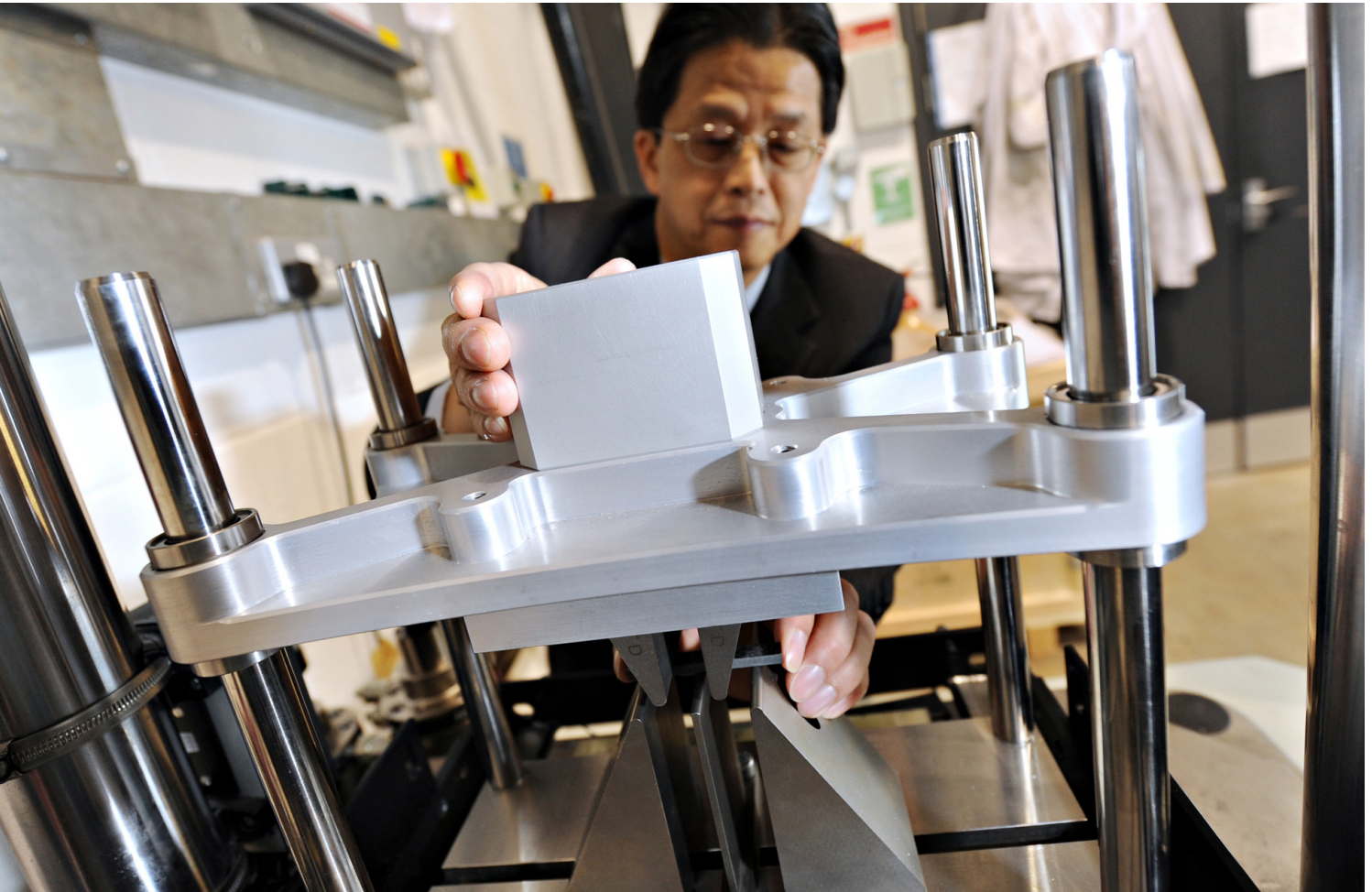
With a focus on tissue engineering of connective tissues including bone, cartilage, tendons, and ligaments, Keele needed a more complex system to perform hydrostatic stimulation on cells and tissues.

[See the solution they chose.](#)



Due to outdated testing systems that were no longer supported by the manufacturer, ANH Refractories began experiencing issues with component replacement and producing less-than-effective testing processes within the labs.

[See the solution they chose.](#)



As highlighted in [Composites News, Issue 2](#) - Double Beam Shear

TRENDS IN TECHNOLOGY

Composites And Tissue Engineering & Regenerative Medicine Newsletters

As two new newsletters that complement our TechNotes and Accessories newsletters, the Composites and TERM newsletters are geared to their specific markets and are designed to keep you up to date on the latest happenings through downloadable white papers, industry and events updates, new product announcements, and much more.

Sneak Peak: Composites News

Instron® has joined a new international group that is seeking to develop a best practice guide and test standards specifically for testing composites at high-strain rates.

As the automotive industry seeks ever-more-urgently to embrace composites, there is an increasing demand for testing composite material behavior at high-strain rates. The need for detailed data to inform crash simulation models first drove a renewed demand for equipment over the last 3 years, and now there is a need for international standardization in methodologies and data handling. The group's aim is to facilitate generation and exchange of reliable and comparable test data in this highly challenging area.

newsletters designed to
keep you up to date on
the latest happenings

The working group has been coordinated by the University of Dayton Research Institute, and currently composes about 20 organizations including major automotive manufacturers, composite materials producers, test houses, and research institutes. As a world leader in high-rate servohydraulic testing systems, the dynamic systems team at Instron are very pleased to share their expertise with this initiative that will make a tangible difference to the industry. Similarly, Instron CEAST will be contributing to work on drop-weight based techniques for high rate testing.

The working group is looking for more European contributors especially, but we would strongly encourage all our customers with expertise in this area to join us in supporting the project. Please feel free to contact Instron applications specialist, Dr. Peter Bailey, if you would like to know more.

[Stay Current with Composites News](#)

Sneak Peak: Instron TERM

There are 124,010 people waiting for a lifesaving organ transplant. Every 10 minutes someone is added to the national transplant list, and every day 21 people die while waiting for a transplant.

In October 2014, the National Organ Transplant Act turned 30. This Act established the framework for the U.S. organ transplant system and has served as a model for developing other transplant networks worldwide. While technology has changed significantly since the 1980s, the need is exactly the same: to provide healthy organs to patients whose bodies are no longer able to sustain normal function. The demand for donors is increasing; however, due to various social changes, the number of donors is decreasing, resulting in a severe donor organ shortage.

Tissue Engineering & Regenerative Medicine research may have an alternate solution. Decellularization – the process by which all of the cells are removed from a piece of tissue or organ – leaves behind a sterile blueprint for organ regeneration. These tissues and organs seem to provide an ideal transplantable scaffold with all the necessary ultrastructure and signaling cues for cell attachment, differentiation, vascularization, and function. This technology, like anything else, needs assistance translating from academic bench top research into a commercially scalable product. Instron's decellularization chambers are enabling this transition. These chambers are designed to maintain a sterile seal while accommodating pressure and perfusion of multiple solutions for complete decellularization. They can be integrated with our GrowthWorks control hardware and software for automated control or used with a simple perfusion pump, depending on the application.

Once an organ has been successfully decellularized it can be recellularized (or populated) with the recipient's cells and transplanted in the same way as donor organs. Using the patient's own cells to populate the organ signals the patient's body to recognize and accept the new organ. This process overcomes the donor shortage and need for harsh immunosuppression.

[Stay Current with Instron TERM](#)

Insights. Industry. Inspire.

Our experts are speaking out to share with you the latest industry insights, delivering first-hand knowledge directly to our readers.





Contract Rental Program for Analytical Equipment

- Tom Davies
Director of Sales
Featured in AZoM



Tissue-Engineered Medical Devices

- Anna Wynn
TERM Business Development Manager
Featured in AZoM



Using Specimen Self Heating Control In Composites Fatigue Testing

- Dr. Peter Bailey
Senior Applications Specialist
Featured in AZoM

It also means that subtle changes in a material that may be missed in a simulation can be measured and identified, allowing operators to compare what they believe is happening to what actually is happening.

~ Dr. Dan Bailey
Instron® Product Manager

Bridging the Gap Between Industry Process and Material Rheology

- Ilaria Di Rienzo, Junior Sales Support Engineer
Featured in [Quality Magazine](#)

Dynamic Testing Market for Composites Sees Growth and Innovation

- Dr. Peter Bailey, Sr. Applications Specialist
Featured in [AM&P Magazine](#)

Using Digital Image Correlation to Measure Full Field Strain

- Dr. Dan Bailey, Product Manager
Featured in [AM&P Magazine](#)

Mechanical Testing of Composites

- Ian McEnteggart, Composites Market Manager
Featured in [Quality Magazine](#)

The Challenge of Developing Testing Standards for Non-Standard Technology

- Anna Wynn, TERM Business Development Manager and Elayne Schneebacher, Applications Engineer
Featured in [Quality Magazine](#)

The Future of Health Care: Tissue Engineered Medical Devices

- Anna Wynn, TERM Business Development Manager
Featured in [Medical Plastics News](#)

LIVE WEBINARS WITH INSTRON® EXPERTS

Our experts spoke on various issues that effect your testing applications: changes in standards, new product capabilities, and software to improve the analysis of test results. If you weren't able to attend one of our webinars this year, there will be more opportunities in 2015 – stay tuned for additional information.

Dr. Dan Bailey



Rich Goshgarian



Joo Wee Oh



Elena Mangano



Mike Boyd



Parasar Kodati

“It is very nice to have some end user help from an equipment provider. The information and delivery was excellent, and my senior colleagues also found it very informative.”

Introduction To Digital Image Correlation Software

With Dr. Dan Bailey

Covering Digital Image Correlation and marking specimens, Dan demonstrated and discussed how our new DIC Replay Software can provide a greater understanding to a material's performance, including the ability to:

- Visualize strain and displacement over the full 2D surface of a specimen
- Analyze a number of advanced strain characteristics after the test
- Check for standards compliance by identifying localized strain that falls outside of the standard gauge length or clip-on extensometer
- Analyze strain and displacement on the flat surface of a part or component where traditional extensometers are impractical
- Visualize and detect cracks that are not visible to the eye

experts spoke on various issues that effect your testing applications

Challenges In Plastics Testing

With Rich Goshgarian, Joo Wee Oh, or Elena Mangano

As a continuation of last year's popular Challenges in Plastics Testing Webinar, Richard Goshgarian, Joo Wee Oh, and Elena Mangano hosted a series of webinars dedicated to changes for common testing standards, common misinterpretations and clarifications of these standards, and different factors that may influence results. This webinar series is aimed at helping labs understand the causes of variability and how to eliminate them, as well as how to make the most accurate measurements.

Packaging Testing Webinar

With Elena Mangano

Focusing on numerous testing challenges that users may not be aware of while performing mechanical tests on packaging seals and films, Elena discusses:

- Finding the optimal gripping technique for sensitive materials
- Optimizing the data capture rate of your test
- Adjusting the bandwidth of your system to collect all relevant events

Challenges In Pipe & Tube Testing

With Mike Boyd

During this webinar, Mike focused on the increased demand for Oil Country Tubular Goods (OCTG) and how global product standards pertaining to pipe and tube testing are evolving to facilitate global standardization. Mike discussing these challenges for pipe and tube manufacturers, along with solutions.

Standards covered include: ANSI/API Spec 5L, ISO 3183:2012, ISO 6892-1:2009, ASTM A370, and ASTM E8M.

Functional Testing and Design Validation

With Parasar Kodati

This webinar focused on how testing products and components in a way that mimics their functional use is one of the most effective ways of ensuring quality, while optimizing the product cost. This webinar was applicable to both novice and experienced individuals to explore the newly redesigned TestProfiler module in Bluehill® 3 Testing Software to improve your lab's efficiency:

- Easily generate cyclical and conditional loading patterns to precisely meet testing requirements
- Use one test method to run multiple variations by making simple choices at the operation stage
- Automate a test sequence by integrating external sensors and actuators with crosshead motion



Advanced Video Extensometer 2
with 3119-600 Series Chamber

NEW PRODUCT ANNOUNCEMENTS

Advanced Video Extensometer 2

By gaining important insights into customer problems, our team of product development engineers designed the second generation Advanced Video Extensometer, AVE 2, that utilizes patented measurement technology in the fastest, most accurate non-contacting strain measurement device commercially available. This collaboration with customers contributed directly to several new features of the AVE 2:

- Conformance to the most rigorous testing standards, including ISO 527 and ASTM D638
- Measurements are taken using the marks that best fit your application – dots and lines, and when using the DIC, speckle or even natural patterns
- Plug-and-play installation dramatically reduces dependency upon PC requirements
- Operator controls when and where you need them – integrated directly into Bluehill® 3 Software
- Easily adapts to a lab's environmental conditions by using previously-held patented technologies that reduces errors from thermal and lighting fluctuations
- A lower-cost option, designed specifically for elastomers, is also available

the fastest, most accurate
non-contacting strain
measurement device
commercially available

3119-600 Series Chamber

Our new range of 3119-600 Series environmental chambers use forced convection for optimum temperature distribution and are for use with dual-column static and dynamic testing systems. We incorporated a number of design features intended to enhance ease of use, safety, and applications coverage.

- The auto-tuning temperature controller gets you to set-point quickly without the need to adjust other parameters
- Rapid heat-up and recovery times lower cost per test by improving throughput
- Air-cooled skin reduces external temperature and interlocks cut the heating/cooling and fan when the door is opened minimizing non-ambient air reaching the operator
- Dual window heaters ensure optimum clarity at low temperatures giving more useful test time when using non-contacting extensometers or other optical devices

1000KPX

For demanding high-capacity applications such as rebar, fastener, and wire strand testing, the new Industrial Series 1000KPX Model with DuraSync Grips provides the ideal solution.

- Withstands high energy release and scaling while maintaining alignment
- Strain or Stress control and AutoX750 meet the latest test standards (ISO 6892-1:2009)
- Low test space reduces operator fatigue and eliminates the need for pit mounting and the use of ladders
- Fully open front grips and hydraulic lifts and locks allow for efficient testing and setup

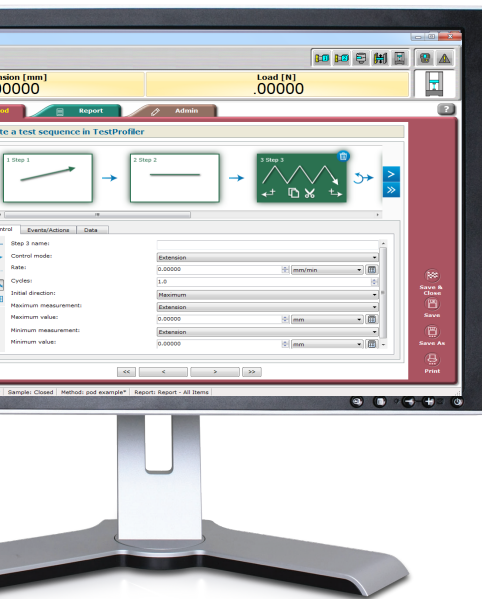


NEW PRODUCT ANNOUNCEMENTS

TestProfiler

Starting with version 3.61, we introduced a completely redesigned TestProfiler feature in Bluehill® 3 Software that accelerates the new product development process by making it easy to setup functional testing of components and devices. This unprecedented flexibility in designing tests that automate a sequence of steps allows companies to accelerate their product verification and validation processes in a world of increasing time to market pressures. TestProfiler allows for easy setup of tests that require:

- Repetitive cycles for component quality testing commonly used with customers testing foam and spring, or performing proof-loading tests
- Step-by-step loading patterns to mimic functional use of biomedical devices and consumer electronics products
- Ability to build test flow logic by monitoring and responding to internal and external sensors and digital states
- Tests with simultaneous temperature control of the specimen



ElectroPuls™ E3000 Linear-Torsion

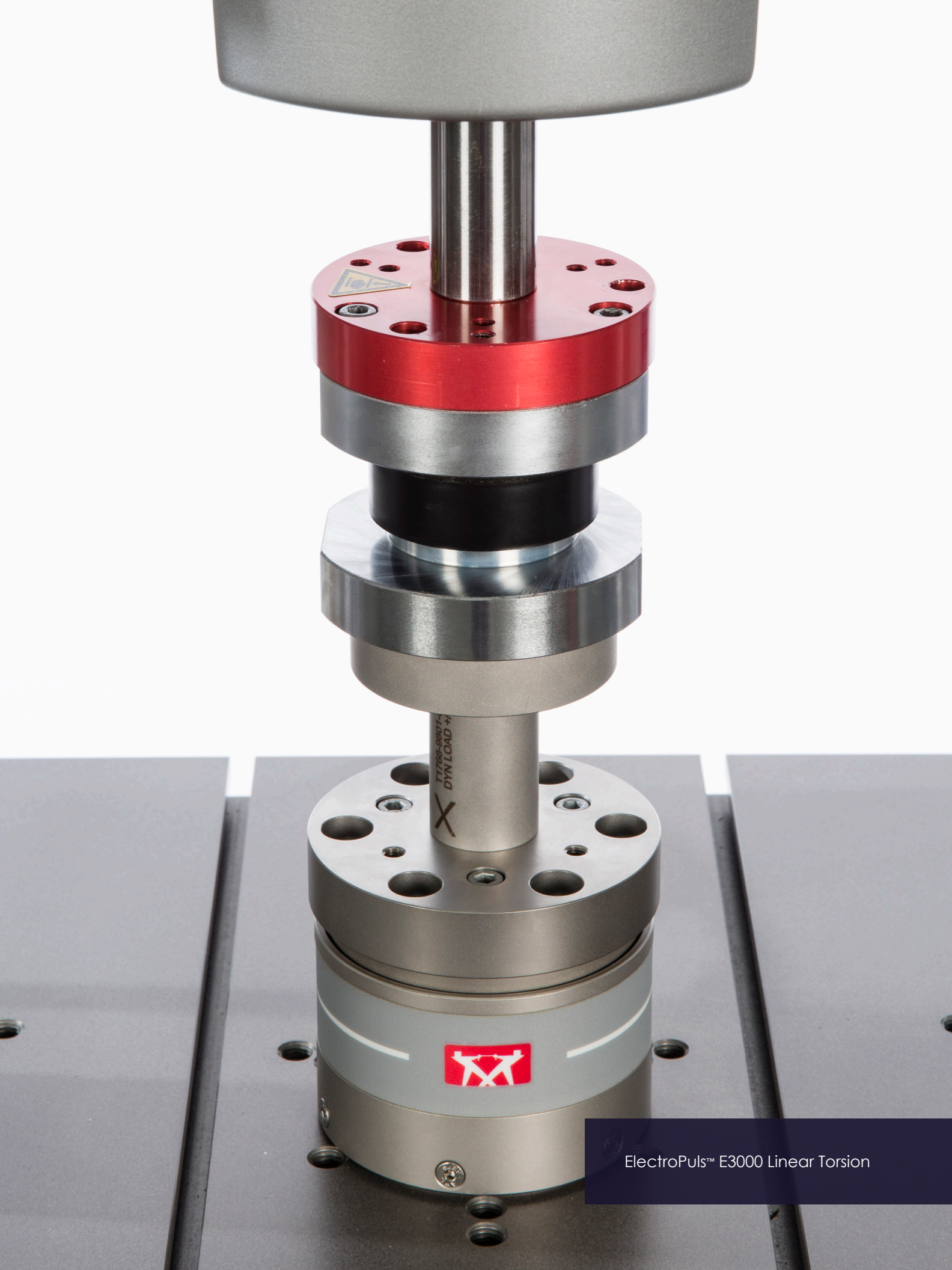
Whether our customers are trying to differentiate their products in the market place, push the boundaries of current research, or develop challenging simulation tests, the result is an increase in demand for more biaxial systems. To meet this need and to expand

additional capability is delivered without any additional complexity

the capabilities of linear and torsion testing, we have introduced the E3000 with a ± 3000 N dynamic linear load capacity and ± 25 Nm dynamic torque capacity. This new addition to the ElectroPuls range of all-electric test instruments is designed for both dynamic and static testing on a variety of materials and components. The E3000 allows for the same benefits of the E10000 Linear-Torsion system, but is designed perfectly for orthopaedic testing and other low-force biaxial tests in the automotive, electronics, components and general research markets. And with our patented biaxial motor drive, all of this additional capability is delivered without any additional complexity to the customer.

Instron® equipment and technical service are outstanding. Joule evaluated many characteristics of plastics, such as tensile strength, stiffness, adhesion, creep, tear, puncture, and ESCR. Instron was important during this process as Joule's test methods were evolving.

*~ Mike Fatica, PhD
Joule Unlimited Inc*



ElectroPuls™ E3000 Linear Torsion

Community Connections

Instron® is focused on making a difference in the everyday lives of not only our customers, but also those that live in our community. In 2014, we contributed to:



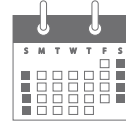
- Norwood Food Pantry Day of Caring
- Hopkinton YMCA Day of Caring
- Pearl Street Cupboard & Café Food Drive and Volunteering
- United Way's Hope for the Holidays Drive
- United Way's Feed-a-Family for Fifty Program
- Girl's Inc. Scholarship Fund
- Wreaths Across America



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Visit the Instron Community Blog



View upcoming events and the latest news



Have feedback or questions? Let us know what you think!

Find out more about the products and services Instron has to offer: www.instron.com



Sampe France Chapter's Annual Bridge Contest

Since 2007, Instron France has provided an electromechanical testing system used for the SAMPE composites bridge contest, which takes place every November during the technical meetings organized by the French chapter of the SAMPE. This year, the contestants - students from various French universities or engineering schools - used a 5969 system to break composites bridges. The winner of the 2014 SAMPE bridge contest is IUT de Saint Nazaire, driven by Professor Pascal Casari.